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ROYAL COMMISSION OF INQUIRY INTO CERTAIN  
DEATHS AT THE HOSPITAL FOR SICK CHILDREN AND  
RELATED MATTERS.

Hearing held  
8th floor  
180 Dundas Street West  
Toronto, Ontario

The Honourable Mr. Justice S.G.M. Grange

Commissioner

P.S.A. Lamek, Q.C.

Counsel

E.A. Cronk

Associate Counsel

Thomas Millar

Administrator

Transcript of evidence  
for


January 23, 1984

VOLUME 90

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ROYAL COMMISSION OF INQUIRY INTO CERTAIN  
DEATHS AT THE HOSPITAL FOR SICK CHILDREN  
AND RELATED MATTERS.

Hearing held on the 8th Floor,  
180 Dundas Street West, Toronto,  
Ontario, on Monday, the 23rd  
day of January, 1984.

- - - -

THE HONOURABLE MR. JUSTICE S.G.M. GRANGE - Commissioner  
THOMAS MILLAR - Administrator  
MURRAY R. ELLIOT - Registrar

- - - -

APPEARANCES:

P.S.A. LAMEK, Q.C. )	Commission Counsel
E. CRONK )	
T.C. MARSHALL, Q.C. )	Counsel for the Attorney
D. HUNT )	General and Solicitor General
L. CECCHETTO )	of Ontario (Crown Attorneys
	and Coroner's Office)
I.G. SCOTT, Q.C. )	Counsel for The Hospital
I.J. ROLAND )	for Sick Children
M. THOMSON )	
R. BATTY )	
B. PERCIVAL, Q.C. )	Counsel for The Metropolitan
D. YOUNG )	Toronto Police
W.N. ORTVED	Counsel for numerous Doctors
	at The Hospital for Sick
	Children
B. SYMES	Counsel for the Registered
	Nurses' Association of Ontario
	and 35 Registered Nurses at
	The Hospital for Sick Children
H. SOLOMON	Counsel for The Ontario
	Registered Nursing Assistants

(Cont'd)







APPEARANCES (Cont'd):

D. BROWN Counsel for Susan Nelles -  
Nurse

G.R. STRATHY )  
E. FORSTER ) Counsel for Phyllis Trayner -  
Nurse

J.A. OLAH Counsel for Janet Brownless -  
R.N.A.

B. KNAZAN Counsel for Mrs. M. Christie -  
R.N.A.

F.J. SHANAHAN Counsel for Mr. & Mrs. Dominic  
Lombardo (parents of deceased  
child Stephanie Lombardo); and  
Heather Dawson (mother of  
deceased child Amber Dawson)

W.W. TOBIAS Counsel for Mr. & Mrs. Hines  
(parents of deceased child  
Jordan Hines)

J. SHINEHOFT Counsel for Lorie Pacsai and  
Kevin Garnet (parents of  
deceased child Kevin Pacsai)

V. NESLUND Counsel for Dr. Buehler

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--- On commencing at 10:00 a.m.

THE COMMISSIONER: Yes, Mr. Lamek?

MR. LAMEK: Thank you, Mr. Commissioner.

We have today, sir, something of a departure in that we have four witnesses. We have got a four for one today, and they are Drs. Smith, Wallace and Buehler who are three of the four authors of the so-called Atlanta Report, and Mr. Robert Kusiak, who is with the Ontario Government and provided skills of a statistician to the authors of the report.

Before I go on with that evidence, sir, perhaps I can say a couple of things.

The fourth of the authors of the report, Dr. Clark Heath, is as I think you know not available this week. He will be here if he is needed the beginning of next week, and I propose, sir, to proceed with three authors of the report who are here as a panel.

One of them, that is to say Dr. Smith, will provide most of the information with respect to the background and the initial involvement of the Centers for Disease Control and the Ontario Ministry and the Federal Government in this study, and I suggest that thereafter I and any other counsel who





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1  
2 may subsequently cross-examine either address  
3 questions to the panel as a whole, leaving it to the  
4 panel members to decide who should give the initial  
5 response to the question, or address a question to  
6 a particular member of the panel, and if that member  
7 thinks that the question could more easily or  
8 properly be answered by another member, he will so  
9 suggest. But in either case either in the case of  
10 a question to the panel or to a particular member,  
11 once the question has been initially answered if  
12 any other member of the panel disagrees with the  
13 answer or wishes to add to it or explain it or  
14 amplify it in any way, then I have suggested that  
15 he or she feel free to do so, and in that way I  
16 hope it will not be necessary to ask specifically  
17 each time whether the other authors of the report  
18 agree with the particular thing that has been said.

17 I think we may take it that if  
18 there is any disagreement or desire to add anything  
19 that will be forthcoming from the members of this  
20 panel.

21 For the comfort of the Court  
22 Reporters, I have asked each member of the panel  
23 who speaks each time he or she does so to give a  
24 name.  
25







A.3

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THE COMMISSIONER: Yes.

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MR. LAMEK: And that is going to be a difficult thing I know to follow every time and I think we must be alert --

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THE COMMISSIONER: As long as we do it the first few times.

7

8

MR. LAMEK: Yes.

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THE COMMISSIONER: I think the Reporters are smarter than the rest of us and will catch on to that.

11

MR. LAMEK: Yes.

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Now as I say Mr. Robert Kusiak is also available to answer questions. He was not one of the authors of the report but is a statistician with the Provincial Government and he was seconded to this study and he worked with the study team contributing his statistical skills.

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A particular word if I may, sir, about Dr. Buehler. Clearly we are very grateful for his having come here. We are grateful to the Centers for Disease Control and the U.S. Department of Health and Human Services for permitting him to do so.

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However, I understand representatives of the Centers for Disease Control when they give







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evidence in proceedings that do not involve the Government of the United States do so under certain clearly stated strictures, and in particular Dr. Buehler is here as a fact witness to give evidence as to his involvement in the study, as to the design and execution of the study, as to the actual conduct of the study and as to the conclusions reached.

He is not permitted and I know you would not want him in any event to do this, he is not permitted to give evidence as an expert witness on matters of which he has no personal knowledge, and he is in general terms required by his employer not to answer hypothetical questions.

Dr. Buehler is accompanied by counsel for the CDC, sir, Miss Verla Neslund, and I am happy to introduce her to you, Mr. Commissioner.

I have been so bold as to speak for you, sir, and to tell Miss Neslund that if I or any other counsel should ask a question which Dr. Buehler is not permitted to answer under the terms of his employment, that you will permit her to make the appropriate objection rather than requiring her to make any comment through me or anyone else.





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I don't know if the witnesses have been sworn but perhaps we could do that if they have not.

THE COMMISSIONER: I wonder if perhaps before we do that, has anyone any comments or suggestions on this procedure which is certainly not traditional. I have been bullied into it by Mr. Lamek. If it doesn't work, if it becomes a circus we will just have to go back to more traditional lines, but this would help if it works, and Mr. Lamek gets full credit. If it doesn't, I think we can appropriately blame him.

MR. LAMEK: I will have to resign!

MS. SYMES: Mr. Commissioner, I am not sure how it is going to work, but I would like to reserve the right to make submissions to you with respect to the conduct of cross-examination after we see the order in which the evidence comes in from the panel of witnesses.

THE COMMISSIONER: Yes. Well, you can always do that.

THE COMMISSIONER: Anything else?  
Well, you have started off well,  
Mr. Lamek.

MR. LAMEK: So far so good.







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DR. LESBIA F. SMITH, Sworn  
DR. JAMES WALTER BUEHLER, Sworn  
DR. EVELYN MacKENZIE WALLACE, Sworn  
MR. ROBERT KUSIAK, Sworn

DIRECT EXAMINATION BY MR. LAMEK:

Q. Dr. Smith, perhaps I could start with you in terms of background qualifications and so on. I understand that you were born in Puerto Rico and were at elementary school there?

(ANSWERS BY DR. SMITH)

A. Yes.

Q. You went to the United States for high school and university education in New York, and were graduated from State University of New York at Buffalo, in the School of Medicine in 1968.

A. That is right.

Q. With the degree of Doctor of Medicine?

A. Yes.

Q. Subsequently, your post-graduate training and internship at the Deaconess Hospital in Buffalo, residency from 1969 to 1973 there, essentially - not entirely there - but in internal medicine.

A. That is correct, yes.

Q. 1970 to 1971 you spent at the Toronto General Hospital as a senior assistant







1 (ANSWERS BY DR. SMITH)

2 resident in internal medicine and you completed  
3 your residency at other hospitals in Toronto?

4 A. That is correct.

(2) 5 Q. You have taken a number of  
6 graduate courses related to the work which you now  
7 do, and since 1981 you have been a senior medical  
8 consultant in environmental health with the Ontario  
9 Ministry of Health and concerned particularly with  
10 environmental epidemiology, investigations of out-  
11 breaks and surveillance of potential situations I  
take it?

12 A. That is correct.

13 Q. You have provided me with a copy  
14 of a curriculum vitae from which I have obviously  
15 been extracting information and would you so identify  
it, please?

16 A. Yes.

17 MR. LAMEK: May that be the next  
18 exhibit, sir?

19 THE REGISTRAR: Exhibit 319.

20 THE COMMISSIONER: Exhibit 319.

21 --- EXHIBIT NO. 319: Curriculum Vitae of  
Lesbia F. Smith.

22 MR. LAMEK: Q. Dr. Wallace, you were  
23 born far away also in Edinburgh?

24 A. (Dr. Wallace): Yes.

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(ANSWERS BY DR. WALLACE)

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Q. And your medical degree at the University of Edinburgh and were graduated in 1967 with the degrees of Bachelor of Medicine and Bachelor of Surgery?

A. Yes.

Q. You subsequently interned at the Edinburgh City Hospital in internal medicine and paediatrics and subsequently at the Queen Elizabeth Hospital in Barbados in surgery and gynecology?

A. That is true.

Q. At some point and I confess it is not entirely clear from the curriculum vitae that you provided to me, you came to Canada and you spent the years from 1973 to 1980 in general practice in Nova Scotia, and in 1980 moved to Toronto?

A. That is correct.

Q. In 1981 you became a field epidemiologist with the Laboratory Centre for Disease Control, Ministry of Health and Welfare of Canada, and you were seconded to the Province of Ontario working with the Disease Control and Epidemiology Service of the Provincial Ministry of Health?

A. That is correct.







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(ANSWERS BY DR. WALLACE)

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Q And indeed as I understand it  
you were in that capacity when you became involved  
in the study with which we are concerned today?

A Yes.

Q That was a two-year appointment  
with the federal Ministry, and upon its expiry in  
1983 you became a consultant in the Division,  
Department of Infectious Diseases of the Ontario  
Ministry of Health?

A Yes.

Q And that is your present  
position, is it not, Dr. Wallace?

A Yes.

Q And similarly could you identify  
for me, please, a copy of the curriculum vitae that  
you provided to me?

A Yes.

THE COMMISSIONER: Okay. Thank you.  
320.

--- EXHIBIT NO. 320: Curriculum Vitae of  
Evelyn MacKenzie Wallace.





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(ANSWERS BY DR. BUEHLER)

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Q. Dr. Buehler, on days like this you must wish you had stayed at home, you were born in California I understand?

A. That is correct.

Q. And did your undergraduate work in Biochemistry at the University of California at Berkeley, and subsequently the Medical School, the University of California, San Francisco, and were graduated in 1977 with the degree of Doctor in Medicine?

A. Yes.

Q. Subsequently you did an internship in residency in Pediatrics in Phoenix; and I can't refrain from mentioning this it sounds intriguing, you spent a period of about eight months, 1979 to 1980, as a General Medical Officer at the Lyndon B. Johnson Tropical Medical Center, Pago Pago, American Samoa. It sounds like a very good way to take a break in a residency.

You subsequently completed your residency in Pediatrics at the University of Oregon and hold the Diploma of the American Board of Pediatrics as of February of last year.

Since 1981 you have been with the







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(ANSWERS BY DR. BUEHLER)

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Centers for Disease Control, initially as an  
Epidemic Intelligence Service Officer in the  
Field Services Division, and laterally, since July  
of 1983, as a Medical Epidemiologist in the  
Pregnancy Epidemiology Branch, Division of  
Reproductive Health, in the Centers for Disease  
Control?

9

A. Yes.

10

Q. You have listed publications

11

which I will not embarrass you by referring to, they  
are included in your curriculum vitae. I ask you,  
Dr. Buehler, could you identify that as a copy of  
your curriculum vitae please?

14

A. Yes.

15

THE COMMISSIONER: Exhibit 321.

16

--- EXHIBIT NO. 321: Curriculum Vitae of  
Dr. James Walter Buehler.

17

18

MR. LAMEK: Q. And Mr. Kusiak,  
you have the distinction I think of being the only  
native born Canadian in the group.

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(ANSWERS BY MR. KUSIAK)

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A. Apparently.

22

Q. You I understand did your

23

undergraduate work at Queen's?

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(ANSWERS BY MR. KUSIAK)

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A. That's true.

4

5

Q. Where you did mathematics and  
physics and graduated with first class honours in  
the B.Sc. program in 1971?

6

A. That's true.

7

8

Q. And subsequently a Masters  
in Mathematics at the University of British  
Columbia?

9

10

A. That's true.

11

12

Q. And you are a member of the  
Institute of Applied Mathematics and Statistics?

13

A. That is true.

14

15

Q. You are currently engaged in  
a part time Masters Course in statistics at the  
University of Toronto?

16

A. That is true.

17

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Q. Since 1975 you have been with  
the Provincial Government, as I understand it,  
initially as a Statistician in the Chief Coroner's  
Office; and subsequently with the Ministry of the  
Attorney General and currently as I understand it  
with the Ministry of Labour?

22

A. That is true.

23

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Q. And you too have a list of





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(ANSWERS BY MR. KUSIAK)

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publications as set out on the curriculum vitae

4

which you provided, could you identify that for me  
please?

5

A. Yes sir, that is it.

6

MR. LAMEK: Thank you.

7

THE COMMISSIONER: Exhibit 322.

8

--- EXHIBIT NO. 322: Curriculum Vitae of  
Robert Kusiak.

9

10

MR. LAMEK: Q. Now, as I said  
earlier, I understand you, Dr. Smith, are going to  
help primarily with the background and the investi-  
gation that was carried on by the two Canadian  
governments, the Ontario and the Federal government,  
in the Centers for Disease Control.

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(ANSWERS BY DR. SMITH)

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A. It is my understanding that  
some time in late July Dr. Carver, on behalf of  
the Hospital for Sick Children --

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Q. I am sorry, that is what year?







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(ANSWERS BY DR. SMITH)

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A. That would be 1982.

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Q. Yes.

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A. -- on behalf of the Hospital for Sick Children approached Dr. Conrad of the Centers for Disease Control to ask him for advice and to send a team perhaps to the Hospital to do an investigation of the cardiac mortality which had occurred and which had been under some scrutiny during the inquiry, the Nelles inquiry.

11

Q. The preliminary inquiry?

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A. The preliminary inquiry, yes. Subsequent to that the Centers for Disease Control advised I believe, I believe advised the Hospital that they would have to be invited by the government agency and both the Provincial and the Federal government were approached to invite the Centers for Disease Control officially to send a team here to perform an investigation.

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Q. And the investigation that ensued, as I understand it, was a joint activity by the Centers on your part on behalf of the Ministry of Ontario, and Dr. Wallace who was seconded to the Ontario Ministry but at that time an officer with the Federal Government?





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(ANSWERS BY DR. SMITH)

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A. That is correct.

4

Q. Dr. Smith, I am showing to you

5

a copy of what appears to be a memorandum dated

6

September 3rd, 1982 from Dr. Conrad and Dr. Brachman,

7

a Director for the Centers for Disease Control, and

8

I notice a copy has been directed to you.

9

A. Yes.

10

Q. Did you receive a copy of that

memorandum at or about September 3, 1982?

11

A. Yes I did, I received a copy of

12

that on September 27th.

13

Q. And you have a copy before you

at the moment?

14

A. Yes, I do.

15

Q. And does that memorandum

16

accurately summarize, so far as you are aware, the

17

genesis of this investigation?

18

A. Yes sir.

19

Q. And the involvement of the levels

20

of government in Canada and the Centers for Disease

21

Control in Atlanta?

22

A. Yes.

23

MR. LAMEK: Mr. Commissioner, this

24

is a useful short summary and perhaps it might be

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marked as the next exhibit please.

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THE COMMISSIONER: Exhibit 323.

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--- EXHIBIT NO. 323: Memorandum from Office of  
the Director of Field  
Services Division,  
Epidemiology Program Office  
to Director, Centers for  
Disease Control, September  
3, 1982.

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MR. LAMEK: Q. Dr. Smith, I have just  
one question about it, about this memorandum, and it  
is possible - and Dr. Buehler may be able to help,  
in the first paragraph of the memorandum the writers'  
record telephone, or discussion between Dr. Carver,  
the Chief of Pediatrics, or the then Chief of  
Pediatrics for the Hospital and Mr. Conrad, making the  
request that you have described to us. The second  
half of the first paragraph reads:

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"From approximately March 1980 through  
March 1981, 6 infants who had been  
hospitalized for various cardiac  
diseases died, and their deaths were  
suspected to have been related to  
excessive levels of digoxin."

21

22

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I suppose I could have asked Dr. Carver  
had I known about this at the time. Do you have any  
information as to the infants to whom he referred in  
referring to 6 infants who were suspected to have died





1  
2 of digoxin - to have had excessive levels of digoxin?

3 (ANSWERS BY DR. SMITH)

4 A. At the time that I saw this  
5 memorandum I had no idea what the numbers referred to.

6 Q. Dr. Buehler, is that something  
7 you can help us with?

8 A. (Dr. Buehler): I can't help  
9 you with that.

10 Q. You don't know?

11 A. (Dr. Buehler): No.

12 Q. Okay. That was the beginning  
13 of the story and perhaps we can come back to fill in  
14 the intervening bits, but let us move to the end of  
15 it if we may.

16 The CDC through Drs. Buehler and Heath  
17 and no doubt its support services and resources did  
18 participate in the study, and the result was the  
19 report which has become known as the "Atlanta Report".

20 I am showing to you, Dr. Smith, and  
21 perhaps your colleagues would care to look at it too,  
22 a binder which contains not merely the text of the  
23 report with figures, appendices and so on, but also  
24 bound with it from something called "Draft Terms of  
25 Reference" dated August 9th, 1982, and then the keys  
to the numerical codes which are used in the report





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(ANSWERS BY DR. SMITH)

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to identify patients and nurses.

4

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6

Could you identify for me please, in fact all the documents contained in that binder but more particularly number 4, the report which you and your colleagues produced?

7

A. This is the report.

8

9

Q. Yes, and there is a letter of transmittal on the very front page?

10

11

12

A. That is correct. And these are the draft Terms of Reference which were received I believe on September 9th in my office.

13

Q. Yes?

14

A. From the Hospital for Sick Children.

15

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Q. And the keys to the codes which are included and for which certain deletions have been made so as to leave only the children in whom this Commission is expressly interested?

19

A. These are the codes.

20

21

MR. LAMEK: Thank you. Could that report be the next exhibit, please, and the other reports bound with it?

22

THE COMMISSIONER: Exhibit 324.

23

24

25







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TORONTO. ONTARIO

Smith, Buehler,  
Wallace, Kusiak,  
dr.ex. (Lamek)

204

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--- EXHIBIT NO. 324:

Draft Terms of Reference,  
dated August 9th, 1982,  
together with other reports  
bound with it.

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BmB.jc  
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(ANSWERS BY DR. SMITH)

Q Now, Dr. Smith, the transmittal letter that is bound with the report is not dated. Are you able to tell me please when was the report delivered to the Ministry of Health?

A It was delivered on February 16th, 1982 at 2 p.m.

Q 1980 ...?

A 1982.

Q 1983 I would think.

A 1983 at 2 p.m.

THE COMMISSIONER: I am sorry, February 16th at ... ?

DR. SMITH: February 16th, 1983.

THE COMMISSIONER: This may be more idle curiosity than anything else. Were you asked not to date it or is it a custom? You certainly knew the time and the date.

DR. SMITH: Yes. We were advised of the time and date quite late on and we had every intention of dating it that day and did not do so. But that is the correct day, the letter had been done the day before.

THE COMMISSIONER: But my question was, were you asked not to date it?







C.2

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DR. SMITH: No, we were not asked not  
to date it.

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THE COMMISSIONER: No.

5

DR. SMITH: That was an oversight on  
my part.

6

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MR. LAMEK: Q. The letter of trans-  
mittal, Dr. Smith, is addressed to the Minister of  
Health, the Honourable Larry Grossman, Q.C. Was the  
report in fact delivered to the Minister?

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(ANSWERS BY DR. SMITH)

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A. No, it was not delivered to  
the Minister personally, it was delivered to the  
Deputy Minister of Health, at that time Mr. Graham  
Scott.

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15

Q. And at that time were copies of  
the report delivered to any other persons?

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A. Yes. The copies were delivered  
directly to Mr. Scott and he immediately gave copies  
to the Attorney General and the Coroner's Office  
and other persons who were present at the meeting  
when the report was delivered.

20

21

Q. Was the Attorney General at the  
meeting?

22

23

A. No, he himself was not. There  
was a representative there.

24

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C.3

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(ANSWERS BY DR. SMITH)

Q A representative of the Attorney  
General's Ministry and of the Coroner's Office?

A Yes.

Q Do you recall anyone else who  
at that time received a copy of the report?

A Yes, there were members of the  
Police Department there as well.

Q Now, could we look at the binder,  
please. The first tab appears to be a memorandum  
setting out draft terms of reference. It is dated  
August 9th, 1982. You have told me I think that you  
received this document at your office on August 9th,  
1982?

A No, we actually received it on  
September 9th.

Q September 9th, I'm sorry, my  
mistake, you are right.

A The first week of September,  
not in August.

Q Do you know whose draft this was?

A At that time, and it is still  
my understanding that this was put together by the  
Hospital.

Q Because it was merely a draft





C.4

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(ANSWERS BY DR. SMITH)

3

and the terms of reference as eventually stated  
differed slightly. Could you turn with me please  
to the preface to your report under Tab 4 in the  
binder and there following the very first paragraph  
are the terms of reference as stated by the authors  
of the report?

8

A. That is correct, yes.

9

Q. And they speak for themselves.

10

I tell you, Dr. Smith, as I read them they are  
substantially the matters that were referred to in  
the draft terms of reference which you understand  
to have been prepared by the Hospital as some  
consolidation of items. Is there any particular  
matter that you can now recall which was suggested  
by the Hospital as a topic for investigation but  
which your team decided not to investigate?

17

A. I believe that we addressed  
all of their concerns but under No. 6 in the final  
terms of reference this particular investigation  
was submitted as a separate report, which was an  
assessment of the Pathology Department.

21

Q. I see. Now, other than the  
suggestion which came as you believe from the Hospital  
for the terms of reference of the investigation, did

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C.5

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(ANSWERS BY DR. SMITH)

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anybody else contribute to the refinement or

4

eventual formulation of those terms of reference

5

other than the members of the investigative team?

6

A. I don't believe so.

7

Q. All right.

8

A. Only the team.

9

Q. Now, before going further into  
the study and the contents of the report, Dr. Smith,

10

the initial request for the assistance of the Centers

11

for Disease Control appears to have come from the

12

Hospital and in particular from Dr. Carver. I under-

13

stand that Dr. Carver at one time had some association

14

with the Centers for Disease Control. Is that your

15

understanding as well? Perhaps Dr. Buehler can help  
us with that?

16

A. (Dr. Buehler): Dr. Carver is a  
former member of the Epidemic Intelligence Service.

18

Q. Which was the capacity which  
you first occupied when you went to the Centers?

20

A. (Dr. Buehler): Yes, that is correct.

21

Q. Okay. Do you have any infor-  
mation as to how long he was there and whether he was  
operating as an epidemiologist at the time?

23

A. (Dr. Buehler): I cannot speak to  
Dr. Carver's C.V.

24

25





C.6

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(ANSWERS BY DR. SMITH)

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4

Q. Okay. Do you have any information as to that, Dr. Smith?

5

A. No, I do not.

6

7

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12

Q. You told us that the CDC couldn't respond to the request that came from the Hospital unless the Canadian and Provincial Governments became involved and that happened. But the initial request came from the Hospital. Did the Hospital receive a copy of the report at or about the time that it was submitted to the Ministry of Health and received by the other people whom you have identified?

13

A. No, it did not.

14

15

16

Q. Was the Hospital or was anyone at the Hospital made aware by any member of the investigation team of the conclusions or the contents of the report?

17

18

19

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22

A. Yes. As the investigations were taking place we kept Dr. Carver briefed on a regular basis, weekly or every two weeks. On the day that we presented the report to the Ministry Dr. Buehler and Dr. Heath met with Dr. Carver and it is my understanding and I believe Dr. Buehler can speak to the detail of that meeting.

23

24

25

Q. Well, perhaps Dr. Buehler can





C.7

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2

(ANSWERS BY DR. SMITH)

3

tell us about that, about that meeting?

4

A. Yes.

5

Q Other than as you have told me

6

though in the regular briefings or communications

7

with Dr. Carver, were you yourself involved in any

8

subsequent discussion of the report with anyone at  
the Hospital?

9

A. No.

10

Q Dr. Buehler, I wonder if you

11

would be good enough to tell us what occurred on the

12

day of delivery of the report, your meeting with

13

Dr. Carver?

(ANSWERS BY DR. BUEHLER)

14

A. Well, we spoke briefly with

15

Dr. Carver that morning. Really, there was nothing

16

to tell Dr. Carver at the time that in substance he

17

wasn't familiar with before. We had never released

18

in detail to members of the Hospital the particulars

19

of the evaluation that was formed by Dr. Nadas or

20

Dr. Kauffman, and we did not release that information

21

at that time.

Q All right.

22

A. I think it is important to keep

23

in mind the background under which the study was

24

25







C.8

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(ANSWERS BY DR. BUEHLER)

3

conducted and, that is, the study was conducted in  
the sense of full co-operation and participation  
with the Hospital and in a sense the Hospital to a  
large extent was a co-participant in the study.

6

7

8

9

Q. And to the extent that Dr. Carver  
may not thitherto have been aware of them, did you  
on February 16th disclose to him the conclusions at  
which you had arrived in your report?

10

11

12

13

14

15

A. Dr. Carver knew that we had  
detected an increase in mortality rates at the  
Hospital. He was earlier aware of the finding  
concerning associations between members of the  
Hospital staff and certain deaths. He was never  
given the particular details of that, only in a  
general sense.

16

17

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21

Q. All right. Perhaps, Dr. Buehler,  
you too could deal with this question. From  
February '83 up until now has there been any  
publication by the Centers for Disease Control of  
the report or of any information about the study and  
its conclusions?

22

23

24

25

A. There have been two brief  
publications that deal with limited parts of the report.

Q. Yes.





C.9

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(ANSWERS BY DR. BUEHLER)

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A. The first was in April, 1983

at the Annual Epidemic Intelligence Service  
Conference sponsored by the Centers for Disease  
Control and at that time I presented a 10-minute talk  
followed by a 10-minute question and answer session  
which dealt with some of the general epidemiologic  
findings.

In particular, we had been asked not  
to discuss publicly any of the findings that dealt  
with possible associations between Hospital personnel  
and deaths and at that meeting and throughout that  
time we very carefully avoided any discussion of that  
part of the report.

Q All right.

A. In November of the past year I  
gave virtually the same talk at the Annual Meeting  
of the American Public Health Association in Dallas,  
Texas.

Q And it is my understanding,  
Dr. Buehler, that a paper describing the study and  
some of its conclusions has been drafted for possible  
publication. Is that so?

A. That is correct. We feel that  
there are certain public health implications that





C.10

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(ANSWERS BY DR. BUEHLER)

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deserve dissemination in the scientific form. We

4

have prepared a draft manuscript that is still at

5

the stage of a draft. In approximately June or July

6

of last summer we sent a copy of that draft to the

7

Hospital both as a matter of courtesy and to ask

(2)

8

whether or not they had any concerns about background  
information concerning the Hospital.

9

Q All right. I take it,

10

Dr. Buehler, that in neither of the talks which you

11

have given, nor in the draft paper for publication,

12

is there any reference to any association between

13

death and Hospital personnel?

14

A We have been asked publicly did

15

we address that issue and we have said yes, we did

16

address that issue but we have avoided any discussion  
of the results of that part of the investigation.

17

Q Dr. Buehler, while I've got you

18

there answering questions, perhaps you could tell me

19

something perhaps I should have asked you when I was

20

talking about your C.V. with you. What is or what

21

are the Centers for Disease Control?

22

23

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25







D/EMT/ko

(ANSWERS BY DR. BUEHLER)

A. The Centers for Disease Control is a federal agency of the United States Public Health Service which is part of the Department of Health and Human Services. The CDC is a federal agency which is primarily responsible for preventing disease, monitoring occurrence of disease and promoting health in the United States.

In the United States health is a responsibility of the individual states and the mission of the CDC is to assist the states in promoting health and preventing disease.

Q. While we are on definitions and basic concepts like what is the CDC, help us all, please, what is an epidemic?

A. I think in a general sense you can say that an epidemic is an unusual increase in the occurrence of a disease in a population.

Q. And I take it epidemiology is a study of such situations and an attempt to discern their causes when they occur?

A. That is correct. Epidemiology is the study of the pattern in both health and disease in populations. The purpose of that study is to promote health and to prevent disease.





D 2

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Q. Dr. Smith, to help me with those basic concepts you earlier furnished to me a definition of epidemic and a skeleton outline of the approach to the investigation of a suspected epidemic together with a copy of a textbook chapter entitled "The Practice of Epidemiology".

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I had asked you for some basic help and you were good enough to provide it. Is that the material you provided to me and it has been distributed to all parties?

11

(ANSWERS BY DR. SMITH)

12

A. Yes.

13

14

15

Q. Are you satisfied that for a neophyte like myself that is of some assistance in understanding at least the starting point from which we will take off today?

16

17

A. Yes, that was the purpose of that.

18

MR. LAMEK: Thank you.

19

THE COMMISSIONER: 325.

20

--- EXHIBIT NO. 325: Pages 315-318 "The Practice of Epidemiology" and outline referred to.

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MR. LAMEK: Q. Now at this point perhaps I could address questions to the three or four





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of you at large and you decide who should answer the thing primarily on the understanding as we have said earlier that if anyone has anything to add by way of disagreement, amplification, explanation and so on, I may expect to hear from you.

When did the investigative team, the core of the investigative team, that is to say the three of you and Dr. Heath, first get together?

(ANSWERS BY DR. SMITH)

A. Our first meeting was on September 8th, 1982 at the Hospital for Sick Children in the office of the Administrator, Mr. Stibbards.

Q. And how did you set about to get a feel for the dimensions of the situation that you were going to study?

A. We were first asked to meet with various members of the staff of the hospital. We were given a schedule for that day and for the following day to meet with some half dozen individuals to learn about the hospital, how it was run, the roles of each department and so on.

Q. You say you were asked to do that?

A. Yes.

Q. By whom?







1

2

(ANSWERS BY DR. SMITH)

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A. We were presented with that

4

schedule after our first meeting with the Administrator  
so that we could become acquainted with the place.

5

6

Q. Now you refer I think to those

7

discussions on page number 5 in your report under the  
heading "Interviews". You set out there that you met

8

with members of the hospital staff including

9

administration, pediatrics, cardiology, cardiac

10

surgery, pharmacology, laboratory, pharmacy, nursing

11

and housekeeping?

12

A. Yes.

13

Q. Now there is no reference to

14

pathology there but I understand you also had a  
meeting with Dr. Phillips?

15

A. Yes, we did, and it is an over-

16

sight. It is acknowledged at the end.

17

Q. All right. I am sure he is not

18

hurt.

19

And you say:

20

"The purpose of these meetings was to

21

characterize the working environment

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in various areas of the hospital, to

23

determine what information had already

24

been collected, and to identify

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additional data sources."





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D 5

(ANSWERS BY DR. SMITH)

Now in the course of those meetings did anybody express to you any views or state any theories as to the probable or possible explanation for all or any of the deaths that had occurred?

A. To my recollection in those early interviews we did not discuss specific theories.

Q. All right.

A. Only description of events.

Q. All right.

A. As perceived by the people that we interviewed.

Q. Fine.

DR. BUEHLER: May I add to that answer?

Q. Yes, of course.

(ANSWERS BY DR. BUEHLER)

A. We subsequently met throughout the periods that we were there on and off with other members of the hospital staff, and as you might expect we heard a number of different theories.

Q. Yes?

A. In addition one of our preliminary meetings was with Mr. Tepperman from the Coroner's Office. Mr. Tepperman did have some definite theories.





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(ANSWERS BY DR. BUEHLER)

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Q. The theories were coming to  
you from the beginning from I think it is Dr. Tepperman  
at the Coroner's Office?

5

6

A. Excuse me, Dr. Tepperman.

7

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11

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Q. Your initial meetings at the  
hospital were for the purpose and carried on in the  
vein that is set out in the final paragraph - the  
final sentence in the paragraph headed "Interviews"  
on page 5. This was a fact finding mission about the  
hospital, its structure, what is already known and what  
other information might be available?

13

A. Yes.

14

15

16

17

Q. You refer in that paragraph  
incidentally to meeting with the Coroner's Office -  
Dr. Tepperman I take it - the Centre of Forensic  
Sciences, the Toronto Metropolitan Police and the  
Provincial Judicial Commission.

18

19

By that last reference do you refer to  
the Dubin Committee which I think was then active?

20

(ANSWERS BY DR. SMITH)

21

22

A. Yes, that is correct. Justice  
Dubin met with Dr. Heath only.

23

24

25

Q. I see.

A. Some time in this period.







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Q. Can you tell me, please, what documentary material was furnished to you initially to help you with the study that you were embarking upon?

(ANSWERS BY DR. BUEHLER)

A. I think the first question we were interested in in attempting to answer was was there or was there not an increase in mortality rates on the cardiology service during this time.

Q. Yes.

A. The initial information that we requested was information on the number of deaths in the hospital, on the patient census in different areas of the hospital, and we initially requested charts of some of the patients in question so that we could look at them and begin to get a preliminary sense of what some of the issues were.

Q. I take it at a later stage you obtained or were given access to the medical charts of a large number of babies?

A. Yes.

Q. That is to say including those who had died in the period July 1980 to March 1981? Others from that period who didn't die?

A. (Dr. Smith): Yes.





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(ANSWERS BY DR. BUEHLER)

3

Q. Others from other periods who  
did or did not die? I take it a large number of charts  
were made available to you?

5

6

A. That is correct. We had  
virtually unlimited access to medical records in the  
hospital.

8

9

Q. Similarly I take it the hospital  
made available to you where possible statistical infor-  
mation and records that you required?

10

11

A. Yes.

12

Q. And I think you already said that  
the co-operation you received from the hospital was  
entirely satisfactory?

13

14

A. Yes.

15

16

Q. And I take it if you requested  
material if it was available they supplied it to you?

17

A. Yes.

18

19

Q. You were provided too with work  
space at the hospital as I understand it? Instead of  
having three people saying yes I have had nobody saying  
yes and a nod doesn't show up on the transcript.

20

21

(ANSWERS BY DR. SMITH)

22

23

A. Yes. We had initially  
Mr. Gordon's office which was a very small office for

24

25





(ANSWERS BY DR. SMITH)

one person but we all worked there for about two weeks, and then we had a much larger office with every facility.

Q. I wonder if Mr. Gordon knows there are larger offices in the hospital!

By the time you were conducting your study there was also an ongoing investigation by the Metropolitan Toronto Police as we all know.

A. Yes.

Q. And I understand and I ask you to confirm to me, please, that the Police also had work space at the hospital at the time that you were occupying your work space there?

A. That is right. They were just down the hall.

Q. Can you tell me, please, what contact if any there was between your group and the police investigation team?

A. Well, we had a cordial relationship. We had an initial meeting, just to meet them, and we obtained from them records which they had in their possession and that had been stamped - that had been used in the preliminary inquiry, and they gave us full access to the original records.







1 (ANSWERS BY DR. SMITH:)

2 had generated?

3 A. I do not recall requesting any  
4 additional information from him, no.

5 Q. I take it that however Dr.  
6 Kauffman as a consultant to the police clearly had  
7 access to the complete file of toxicological informa-  
tion about these children?

8 A. That is correct.

9 Q. In the work that he did for your  
10 group was he permitted to disclose those data to you?

11 A. He was not and he did not.

12 Q. Was he permitted to use the  
13 data in his work for you?

14 A. Yes, he was permitted to use  
15 the data to formulate his overall conclusions.

16 Q. And therefore he might express  
17 a conclusion on the basis of information of which you  
were unaware?

18 A. That is correct.

19 Q. All right. But was it by  
20 agreement with the police that he was permitted to make  
21 use of the information although he was not permitted  
to disclose the information to you?

22 A. That is correct.

23 Q. All right. Now, what did you ask  
24  
25





perhaps Jim can elaborate on some of the meetings.

(ANSWERS BY DR. BUEHLER)

A. In our initial meeting with the Police - to be precise I don't recall if it was our initial meeting or a meeting shortly thereafter but we were aware of their concerns about particular nurses.

In addition, as you can imagine, many of the particular records that we were reviewing were records that they were reviewing, and so there was often an interchange of documents.

Q. Yes?

A. We did as part of I would say the cordial relationship we had with the Police, have discussions with them, but in no way was the design of our study or any decisions that we took in terms of executing our study influenced by any discussion we may have had with the Police.

Q. Perhaps we should go back to the chronological sequence of this study then.

You have told me of the way in which you set out to acquire information about the size and the shape of the situation, and how you set about that task. You have also said, Dr. Buehler, that the first task was to establish whether indeed there had been an





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(ANSWERS BY DR. BUEHLER)

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epidemic of deaths I take it on the cardiology wards  
in the period somewhere between the summer of 1980 and  
the spring of 1981, and I take it the exact parameters  
of the time period were not precisely defined at that  
early stage, were they?

7

A. That is correct.

8

9

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11

The first thing that we attempted to do  
was to define a background rate of deaths on the  
cardiology service beginning in January, 1976, through  
to the summer of 1982.

12

Q. Yes?

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14

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16

A. And within several days of being  
at the hospital using the hospital's monthly death  
lists and the hospital monthly census information we  
had generated a figure that resembled quite closely one  
of the figures in the report.

17

Q. That is Figure 3?

18

A. That is correct, Figure 3.

19

20

21

22

The actual information in Figure 3 is  
the result of a tremendous amount of effort to verify  
those numbers, but we had a rough figure within just a  
few days that was nearly identical in configuration  
to Figure 3 as it appears in the text.

23

Q. We have seen here already several

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(ANSWERS BY DR. BUEHLER)

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graphs plotting deaths, not only on the cardiology  
ward but elsewhere.

4

5

To date we have seen graphs which plot  
deaths in I call absolute numbers, raw numbers. This  
graph as I understand it is expressed in mortality  
rates.

6

7

8

Could you explain that concept for us,  
please?

9

10

A. A rate by definition has a  
numerator and a denominator in its calculation. In  
this figure the rate is the number of deaths that  
occurred during a given three month interval.

11

12

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14

The denominator is the number of  
patient days on the ward. A patient day could best be  
defined by example if I were admitted to the hospital  
and spent 10 days in the hospital I would contribute  
10 patient days to the denominator.

15

16

17

18

Q. Yes?

19

A. Conversely if 10 people were  
admitted and spent one day they would also contribute  
10 patient days.

20

21

Q. In the aggregate they would  
produce 10 patient days?

22

23

A. Yes.

24

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(ANSWERS BY DR. BUEHLER)

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Q. And by expressing mortality as

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a rate in that way I take it you can compare one

5

period with another without reference to the

6

particular population of the ward in numerical terms

7

at any given time?

8

A. We can compare one population -

9

we can compare the number of deaths at one time to the

10

deaths in another with respect to the number of patient  
days.

11

Q. Yes?

12

A. The crude rate as these appear

13

do not offer any information as to the quality of those  
patient days.

14

Q. Sorry; I don't understand that.

15

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- - - -

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DM.jc  
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(ANSWERS BY DR. BUEHLER)

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Quality of the patient rates?

4

A. That is correct. For example,

5

if a population at one time were younger or more

6

severely ill --

7

Q. Yes.

8

A. -- that could affect the rates.

9

Q. Yes.

10

A. In addition to the number of

patients who are there at the time.

11

Q. All right. In fact, as I under-

12

stand it then what you have done is merely put us

13

in a position where in terms of numbers one might

14

compare apples in Period A with apples in Period B

15

by expressing mortality as a number per 10,000

16

patient days, it is a rate?

17

A. Yes.

18

Q. You have not told us anything

19

in Figure 3, or indeed in this study, about the make-

20

up of the population of the ward at any particular

21

time, who was making up the 10,000 days and what

22

they have contributed to the mortality rate?

23

A. We attempted to address that

24

issue.

25

Q. At a later stage though?







E.2

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2

(ANSWERS BY DR. BUEHLER)

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A. Yes.

4

Q But at this stage when you were  
looking at mortality --

5

6

THE COMMISSIONER: I think you said  
the report and I think you meant the figures, did you  
not?

7

8

MR. LAMEK: I am sorry?

9

10

THE COMMISSIONER: You said you did  
not in this report consider --

11

12

MR. LAMEK: I am sorry, in this study,  
in this part of the report.

13

14

Q In Figure 3 and the material on  
page 5.

15

16

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18

A. Yes.

Q And your concern at the outset  
was to establish simply in terms of mortality rates  
whether there had been a real increase at any point  
in the period at which you looked?

19

20

A. Yes, that is right, whether or  
not there had been an increase.

21

22

Q Looking at the raw numbers  
there had apparently been an increase?

23

24

25

A. Yes.

Q In the late summer/fall of 1980





E.3

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(ANSWERS BY DR. BUEHLER)

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and the spring of 1981?

4

A. Yes.

5

Q. And by transferring that into

6

rates you were able to determine whether that apparent increase was a real increase? Do I express that correctly?

8

A. The word "real".

9

Q. Just so that I understand.

10

A. It is the word "real" that

11

bothers me.

12

Q. Okay.

13

A. It is not a word that is neatly

14

defined in an epidemiology investigation. The rate

15

is simply, it simply reflects the occurrence of

16

deaths with respect to the number of patient days at

17

risk or having the data, and our interpretation of

18

Figure 3 or a preliminary version which very much

19

resembled Figure 3 was that there had been an

20

apparent increase in the rate of deaths on the

cardiology wards.

21

Q. Well, I am puzzled by "apparent".

22

In terms of rate, the rate had increased had it not?

23

A. That is correct.

24

Q. Not just apparently increased,

it had increased?

25





E.4

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(ANSWERS BY DR. BUEHLER)

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A. Yes.

4

Q. Okay. I will abandon "real" if  
you will abandon "apparent", how is that?

5

A. Okay.

6

Q. At this time Mr. Kusiak, I think  
we need to speak to you, because an increase I suppose  
can be anything from one death per 10,000 to 50  
deaths per 10,000. I take it what we are looking for  
is something that is, I think the language is  
statistically significant, is that right, Dr. Buehler?

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A. Yes.

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Q. Now what is statistical  
significance, please?

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(ANSWERS BY MR. KUSIAK)

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A. Well statistical significance  
is usually stated a little more in terms of  
statistically significant as a certain probability  
level.

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Q. Okay.

A. And customarily that probability  
level is chosen at 5 per cent. So the phrase usually  
goes to this difference, or to this increase, whatever,  
and is statistically significant at the 5 per cent  
level. It is connected with the hypothetical







E.5

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(ANSWERS BY MR. KUSIAK)

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situation. In this instance concerning the rates we have the hypothesis that the rates in the epidemic period, particularly during this nine-month period were the same as the rates for some other period.

Q. Right.

A. So that all hypothesis is that the rates are the same and the alternative to that was that the rates were different. So the question that was asked of me, what is the probability that we would get such a high rate during this one-month period, this one nine-month period given that there is another rate during the preceding period, given that difference, what is the probability that there was no increase? Okay. And if this probability is sufficiently small, in other words less than 5 per cent, then one can conclude with a fair amount of certainty that there was an increase therefore the hypothesis that there was no increase was rejected, is that clear?

Q. Reasonably I think. And perhaps because I have heard it before. Was it your conclusion, Mr. Kusiak, that there was indeed an increase in the rate of mortality in the period which appears to have begun in July of 1980, that was statistically significant?





E.6

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(ANSWERS BY MR. KUSIAK)

A. Yes.

Q. In that first paragraph under the heading "Methods", it is set out that you examined or calculated mortality rates not merely for the cardiology wards, predecessor Ward 5A and then Wards 4A and 4B, but for the Neonatal Intensive Care Unit; and the Intensive Care Unit; the infant medical wards in the Hospital at large. Can you tell me please why mortality rates were calculated for those locations?

(ANSWERS BY DR. WALLACE)

A. We wanted to ascertain exactly where this epidemic was occurring, or this increase in rates was occurring, was this general to the whole Hospital, it wasn't specific to certain wards.

Q. And the results of those inquiries are shown not only in Figure 3 at which we have looked, but in Figure 4 and 5, those are OR cardiac deaths; ICU deaths in Figure 6 for heart patients? As a result of those inquiries and those calculations, did you come to any conclusion as to the place specific nature of the epidemic?

A. Yes, this epidemic was occurring in Wards 4A and B.





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(ANSWERS BY DR. BUEHLER)

Q Did you at that stage draw any distinction between Ward 4A and Ward 4B?

A When we calculated rates we combined Ward 4A and 4B.

Q Yes.

A The figure that you see, the graph that you see in Figure 3 is the graph that was obtained later, and it does show that there was a greater increase in the mortality rate on Ward 4A.

Q Was the increase in the mortality rate that occurred on 4B statistically significant, did you conclude there had been an epidemic of some though perhaps smaller proportions on 4B?

A (Dr. Wallace): I think we found it difficult to come to any definite conclusions.

Q With respect to 4B?

A May I add to that?

Q Yes, of course.

A I would like to direct your attention to page 6.

Q Yes

A And what we have done here is compare the rate of deaths on 4A/B together to the







E.8

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(ANSWERS BY DR. BUEHLER)

corresponding nine-month period during the preceding several years. We then compared the rate on 4A alone to the rate during the preceding years and the rate on 4B alone.

Q. That is the latter half of the first paragraph on page 6?

A. That is correct. If you look approximately three-quarters of the way down that paragraph there is a sentence that reads:

"On Ward 4A during the epidemic period, 8 deaths occurred per 4,401 patient days (18.2 deaths/10,000 patient-days) with one-five deaths per quarter, and the relative risk of death compared to the preceding four years was 1.5 (95% confidence limits - 0.7-3.2)."

What that means is that the rate of deaths was one and a half times greater on Ward 4B during that period when compared to the preceding several years. The 95 per cent confidence limit in a sense corresponds to what Mr. Kusiak described as statistically significant. And if the 95 per cent confidence limit excludes 1.0 we would say that that





E.9

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(ANSWERS BY DR. BUEHLER)

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difference is significant. In this instance the

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range of the 95 per cent confidence limit is 0.7-3.2.

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So that on Ward 4B although there was a relative

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increase of one and a half times that increase was

7

not statistically significant.

8

Q. Was the conclusion of that

9

that appeared to have been an epidemic specific to

10

Ward 4A?

A. Yes.

11

Q. And were you able by plotting

12

the rates, and perhaps you can refer again to Figure 3,

13

to define the period of that epidemic?

A. Yes.

14

Q. How was it defined?

15

A. We defined the epidemic period

16

as the interval between July 1980 through March 1981.

17

Q. Both inclusive?

18

A. Yes.

19

Q. In arriving at that conclusion

20

you made comparisons between different periods; and

21

indeed you have said you compared with the nine-month

22

period, July to March, corresponding periods from

23

other years. Why was it appropriate to use

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corresponding July to March periods for comparison  
purposes?

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E.10

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(ANSWERS BY DR. BUEHLER)

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A. We could have done that calculation either way, using the entire 4 to 5 year intervals preceding that, but we felt that because of the possibility of potential seasonal variations in deaths that we use the corresponding nine months. In this instance the conclusions would not have differed had we used the entire preceding 4 to 5 years.

Q. Set out at the top of page 6 of the report under "Results" the mortality rates shown in Figure (3) for the period January 1976 to September 1982. In other words you went back a period of some four and a half years prior to the beginning of what eventually turned out to be the epidemic period and you went forward some one and a half years after the end of that epidemic period.

Perhaps this is a naive question, does the imbalance of the lack of symmetry between the period examined prior to and that examined subsequent to the epidemic period cause any concern or cause any question to be raised by the validity of the conclusions?

A. (Dr. Smith): One really doesn't raise any concern, there might be the question of







E.11

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(ANSWERS BY DR. SMITH)

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some interventions having taken place, but nonetheless  
the comparisons can be made.

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Q. I am sorry, what do you mean by  
"interventions having taken place"?

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A. There were some changes made on  
the ward, so that as time goes by and certain changes  
do take place, but it is still quite all right to  
compare periods before an epidemic and after an  
epidemic to the epidemic period, there is no specific  
problem.

12

DR. BUEHLER: May I add to that?

13

MR. LAMEK: Yes.

14

(ANSWERS BY DR. BUEHLER)

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A. It is very unusual in  
investigating an epidemic to be in a situation of  
beginning an investigation well over a year after the  
event. In most epidemic investigations you are there  
during or shortly after the peak.

19

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Q. So you have no subsequent  
experience, or very little subsequent experience to  
look at in the normal case?

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A. That is correct.

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Q. This was rather more luxurious  
than the normal situation?





E.12

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(ANSWERS BY DR. BUEHLER)

A. It certainly was.

Q. Did you obtain, or did you attempt to obtain information as to mortality rates on cardiology wards, or perhaps other places in other paediatric hospitals for purposes of comparison?

A. (Dr. Smith): We entertained that as a possibility, but since there were not any comparable hospitals in the province that we would readily have access to we opted for comparing the Hospital to itself for different periods and so on, in the design of the studies that were subsequently performed.

Q. Had information been available from comparable paediatric hospitals would that have in any way strengthened the impressions you arrived at, or would it have produced different impressions, what would have been the significance of information from other comparable hospitals?

A. If a comparable hospital had experienced a similar peak of mortality one might be able to conclude that something was happening in the general population at large that would have affected that peak, not just something in the Hospital. It might have been a more general phenomena that would





E.13

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(ANSWERS BY DR. SMITH)

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have affected more than one hospital.

4

Q. You were not able to get such

5

comparable information?

6

A. No, we were not.

7

DR. BUEHLER: May I answer that?

8

MR. LAMEK: Yes.

9

(ANSWERS BY DR. BUEHLER)

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A. There really was no comparable

11

hospital in Toronto, this Hospital was a major

12

referral centre and as such there was no other major  
cardiac centre in Toronto.

13

I think the other issue is we were,

14

by our preliminary findings and by the nature of the  
problem in general, investigating the question of

15

what happened at this Hospital, we were not terribly

16

concerned with other --

17

THE COMMISSIONER: Excuse me, Doctor,

18

you said there was no other major cardiac, there are

19

of course, there is no other major paediatric

20

hospital in Toronto?

21

DR. BUEHLER: Yes.

22

THE COMMISSIONER: Would the assistance

23

of other cardiac hospitals be of any assistance to

24

you in this investigation?

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E.14

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DR. BUEHLER: I think in this  
investigation I think not.

4

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MR. LAMEK: Q. Essentially what you  
are saying, Doctor, as I understand it, you were  
comparing the Hospital against itself, this period  
as against other periods, this population as against  
other populations in the Hospital itself?

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A. (Dr. Buehler) That is correct.





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Q. Now, I am spending a long time on this mortality rate study but as I understand it, it was fundamental to the whole exercise in deciding whether indeed there had been an epidemic. At the bottom of page 6 you refer to the results of the studies of mortality rates in the ICU. I notice that that is for a different period of time. The study there appears to have begun as of January, '78, not January, '76 as with other areas of the hospital. Is there a particular reason for that?

(ANSWER BY DR. WALLACE:)

A. Yes. The data source we used there was supplied to us by Dr. Barker.

Q. Dr. Barker?

A. Yes.

A. (DR. SMITH) Yes, Dr. Barker.

(ANSWER BY DR. WALLACE:)

A. Who is in charge of the intensive care unit.

Q. And was there no data prior to January '78?

A. He didn't have this recorded.





1  
2 Q. Just going back for a moment  
3 to page 5. At the bottom of page 5 there is something  
4 that apparently you wanted to undertake but were unable  
5 to because the records were not available. You at-  
6 tempted to subdivide cardiac mortality rates by loca-  
7 tion into three separate categories: post-operative,  
8 post-catheterization and post-no procedure, but you  
9 couldn't do that because you couldn't get the patient-  
10 day denominator into those categories. Transfer informa-  
11 tion as to patients in the hospital I understand  
12 was just not available in the form that you required it.

13 A. (DR. SMITH) That is correct.

14 Q. Did the inability to undertake  
15 that portion of the study impair in any way the  
16 validity of the conclusion you reached as to there  
17 having occurred an epidemic.

18 (ANSWERS BY DR. BUEHLER:)

19 A. This is a very complicated  
20 issue. One of the initial things that we attempted  
21 to define when we arrived at the hospital was sources  
22 of information that would allow us to take into account  
23 possible differences in the patient population which  
24 may have explained any increase in mortality rates.  
25 If the patient population during that period were a







(ANSWERS BY DR. BUEHLER:)

younger population, if the patient population were a more severely ill population or if there was a change in relative percentage of patients who had had surgery performed or catheterizations performed, that might affect the mortality patterns.

We met exhaustively with members of the cardiology data group, we met with the director of medical records, with the director of the Admissions Department, with the clinical computers department and we explored a number of potential ways that we might get that information. Unfortunately, the type of information that we sought to subdivide our patient day denominator was not available.

Q. Yes.

A. We engaged the cooperation of the hospital's clinical computers department and worked closely with one of their computer programmers to try and determine whether or not the hospital had computerized records which documented changes in the patient's location or status during hospitalization.

To illustrate that, let me draw your attention to figure 1. You can see from figure 1 that patients commonly moved from one location of the hospital to another; for example, a patient may be admitted to the cardiology ward, undergo an operation,





1 (ANSWERS BY DR. BUEHLER:)

2 return to the intensive care unit and then return  
3 to the cardiology ward and that patient's clinical  
4 status may be different before and after those events;  
5 or a patient may start hospitalization in another  
6 area, particularly the newborn intensive care unit,  
7 undergo heart surgery and return to cardiology wards.  
8 So that an individual patient may contribute different  
9 types of patient days.

9 Q. Yes.

10 A. Pre-operative or post-operative.

11 Q. Yes.

12 A. We, as I mentioned, worked at  
13 great length with the clinical computers department.  
14 Eventually they produced a computer printout which  
15 attempted to document those transfers in the patient  
16 population. Unfortunately, when members of the team  
17 attempted to verify that information we felt that it  
18 was not sufficiently adequate to use.

18 Q. Okay. When you say adequate,  
19 you mean it was not always accurate, it was not  
20 reliable?

20 A. Yes. I will refer that to Dr.  
21 Smith.

22 Q. Okay.





1 (ANSWERS BY DR. SMITH:)

2 A. Yes. The information was not  
3 always accurate.

4 Q. Okay.

5 A. We picked some of the names that  
6 were documented on this list and went back to the  
7 original charts to check to see how many patient  
8 days had been contributed to different locations.  
9 There were enough differences in the printout that  
led us to believe we could not use the totals produced.

10 Q. All right. So, despite your  
11 best efforts and the hospital's best efforts, the  
12 data was simply not available to do this study?

13 A. That is correct.

14 Q. Dr. Buehler, I think the question  
15 I asked you was, was the ability to do this study some-  
16 thing which impaired in any way the validity of your  
17 conclusion. With so much effort having been expended  
18 to try and get this study done, it sounds to me as  
though it was something fairly important to you.

19 (ANSWERS BY DR. BUEHLER:)

20 A. It is an important issue.  
21 However, other results of the study that we will get  
22 into later in terms of our conclusions are less  
23 important and indeed there are other findings that  
24 could not be explained on the basis of a more ill,  
25







1 (ANSWERS BY DR. BUEHLER:)

2 more younger patient population.

3 Q. Okay. I take it then, as you  
4 have told me, the result of the mortality rate  
5 study was that you concluded that you were indeed  
6 dealing with an epidemic of deaths, that the epidemic  
7 had been place specific to the cardiology ward and  
8 in particular to Ward 4-A and it appeared to have  
9 occurred between July, 1980 and March of 1981, as you  
have told me.

10 A. Yes.

11 Q. And I take it the next test  
12 therefore was to seek an explanation for that epidemic.

13 A. That is correct.

14 Q. And that is the balance of the  
15 study, is it not, trying to find an explanation?

16 A. Yes.

17 Q. And as I read the report, to that  
18 end you undertook a number of studies, you considered  
19 a multitude of characteristics and variables. Do I  
20 take it correctly that you were looking for something  
21 that linked those who died or, putting it the other  
22 way, distinguished them from those who didn't and  
23 distinguished them from those who had died or survived  
24 in other periods of time in the hope of finding a reason  
25 for the epidemic. Is that essentially what you were





1 (ANSWERS BY DR. BUEHLER:)

2 about?

3 A. Yes.

4 Q. Okay. Now, we will refer to  
5 some of those studies but let me first digress for  
6 a moment and deal with your retainer of experts and  
7 consultants.

8 At what point did the team decide that  
9 it needed to retain consultants to assist it in this  
10 investigation?

11 (ANSWERS BY MR. SMITH:)

12 A. Very early on in looking at  
13 our terms of reference we realized that the study team  
14 did not have the expertise to deal with some of the  
15 questions, namely, some assessments of clinical status  
16 for which we would need a clinical cardiologist of  
17 some eminence, that we would need a pharmacologist and  
18 a toxicologist. So, fairly early on we realized that  
19 we would need other consultants.

20 Q. Okay.

21 A. Within the first week.

22 Q. Within the first week. All right.  
23 Indeed, because one of the terms of reference included  
24 a review of the pathology department you also needed a  
25 pathology consultant, did you not?

A. Yes, that is correct.





1 (ANSWERS BY DR. SMITH:)

2 Q. Yes. How did you go about  
3 selecting your consultants?

4 A. The hospital had made some  
5 recommendations for consultants.

6 Q. Yes.

7 A. And in addition Dr. Heath, who  
8 I believe will be able to address the question more  
9 accurately since it was he who searched for other  
10 consultants in the United States.

11 Q. Yes.

12 A. Also provided some names, a  
13 roster of names. We spoke to these people, at least  
14 Dr. Heath spoke to these individuals and finally came  
15 up with the names that we used: Dr. Nadis, Dr.  
16 Kauffman and Dr. deSa.

17 Q. Dr. deSa in the pathology area?

18 A. That is correct.

19 Q. Can we consider Dr. Kauffman for  
20 a moment, please. When your team approached Dr.  
21 Kauffman had he already at that stage been retained  
22 as a consultant by the Toronto Police?

23 A. We were not aware at the time that  
24 we spoke to him that he had just been retained  
25 approximately a week before by the police; but yes,  
he had been.







1 (ANSWERS BY DR. SMITH:)

2 Q. When you discovered that did it  
3 cause you any concern that he was indeed acting as a  
4 consultant to the police?

5 A. It caused us some concern. So,  
6 we therefore consulted with the police and we consulted  
7 with Dr. Kauffman to see if we could work out an  
8 arrangement which would suit everyone whereby he would  
9 provide the expertise to both the police team and to  
us without any conflict of interest.

10 Q. Can you tell me please what  
11 toxicological information was available to your group;  
12 toxicological information about the babies who had  
died in this epidemic period. What did you have?

13 A. We had all the information that  
14 was on the charts and, in addition, we had all of the  
15 information which had been presented at the preliminary  
16 inquiry which was excerpted into a single volume.

17 Q. Did you have direct access to the  
18 information and results generated by Mr. Cimbura at  
19 the Center of Forensic Sciences?

20 A. Not unless that information had  
21 been presented at the preliminary inquiry.

22 Q. All right. Did you request any  
23 additional information as to digoxin concentrations  
24 and other toxicological information that Mr. Cimbura  
25





1 (ANSWERS BY DR. SMITH:)

2 had generated?

3 A. I do not recall requesting any  
4 additional information from him, no.

5 Q. I take it that however Dr.  
6 Kauffman as a consultant to the police clearly had  
7 access to the complete file of toxicological informa-  
tion about these children?

8 A. That is correct.

9 Q. In the work that he did for your  
10 group was he permitted to disclose those data to you?

11 A. He was not and he did not.

12 Q. Was he permitted to use the  
13 data in his work for you?

14 A. Yes, he was permitted to use  
15 the data to formulate his overall conclusions.

16 Q. And therefore he might express  
17 a conclusion on the basis of information of which you  
were unaware?

18 A. That is correct.

19 Q. All right. But was it by  
20 agreement with the police that he was permitted to make  
21 use of the information although he was not permitted  
to disclose the information to you?

22 A. That is correct.

23 Q. All right. Now, what did you ask  
24  
25





1  
2 Dr. Kauffman to do?

3 (ANSWERS BY DR. BUEHLER:)

4 A. We asked Dr. Kauffman to review  
5 the available digoxin information and to form several  
6 assessments. Dr. Kauffman's review of information was  
7 limited only to those children who died during the  
8 epidemic period as well as to one death which occurred  
9 one day prior to the defined start of the epidemic  
period.

10 Precisely what we asked him to do is  
11 identified on page 12. First, we asked him to  
12 develop a rating scale to assess whether or not death  
13 was the result of digoxin intoxication. He answered  
14 this using a one to five scale with one representing  
least probable and five representing most probable.

15 Q. Yes.

16 A. In addition, we asked him  
17 to attempt to perform judgments or assessments on  
18 whether or not if digoxin intoxication was suspected  
19 whether or not it was the result of a single acute  
20 dose or multiple overdoses and whether or not he  
21 felt there was information to suggest that other  
22 medications may have contributed or modified the  
response to digoxin.

23 Q. At the top of page 13 you  
24  
25







1 (ANSWERS BY DR. BUEHLER:)

2 record that:

3 "...the consultant attempted to suggest  
4 possible routes and times of administra-  
5 tion of overdoses in the four cases  
6 where sufficient digoxin data to  
7 support such estimates were available."

8 Is that something that he undertook or you requested of  
9 him?

10 A. We requested that from him.

11 Q. Was the scoring system, the one  
12 to five and so on, used by Dr. Kauffman one of his  
13 devising or your devising or what? Was it imposed  
14 upon him, did he design it himself, what happened to  
15 that?

16 A. As I recall, we asked him to  
17 use a scoring system and in appendix 1 is a detailed  
18 description of the scoring system that he used.  
19 Appendix 1 is taken verbatim from the report that  
20 he made to us.

21 Q. Yes. I think you know Dr.  
22 Kauffman has already given evidence here and we have  
23 marked as an exhibit a binder of his returns to your  
24 group, if you will, on the children with whom we are  
25 concerned and if at any stage we need to refer to those  
they are available for you.





1 (ANSWERS BY DR. BUEHLER:)

2 Can we just speak briefly of Dr.  
3 Nadas, please. What was he asked to do?

4  
5 A. We invited Dr. Nadas to give  
6 his impressions as a clinician. We wanted him to give  
7 us an assessment of children who died during the  
8 epidemic period as well as children who died at other  
9 times. The purpose of this assessment as well as other  
10 information that we collected was intended to answer  
11 the question, how did the group of children who died  
12 during this nine month period differ from children who  
died at other times.

13 The issues that Dr. Nadas addressed  
14 were (1) the severity of the child's illness at the  
15 time of admission to the hospital; (2) the child's  
16 prognosis; (3) the timing of the child's death in  
17 respect to the child's clinical status; (4) the  
18 clinical pattern of death and whether or not it  
19 resembled digoxin toxicity; lastly, whether or not  
20 Dr. Nadas felt that a higher level of care may have  
been desirable.

---





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(ANSWERS BY DR. BUEHLER)

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Q. And in order to enable him

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to carry out that test what material was made  
available to Dr. Nadas?

5

6

A. We sent some preliminary  
material to Dr. Nadas to inform him of the situa-  
tion. In making his assessments he used the  
Hospital charts.

9

10

Q. In the case of each child  
was the entire chart available to Dr. Nadas?

11

A. Yes. The original version  
of each chart was available.

12

13

Q. Did he come to Toronto to  
review the charts?

14

A. Yes, he did.

15

16

Q. And in due course you  
received his reports on the children?

17

A. That is correct, yes.

18

19

20

21

22

Q. I am showing to you a binder  
of his reports on those children with whom we are  
particularly concerned, and found at the beginning  
of it is a blank form for cardiac death review,  
and then followed by computer forms in respect of  
36 children under review here.

23

Do you recognize that as being what

24

25







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(ANSWERS BY DR. BUEHLER)

3

I have described it to be?

4

A. Yes.

5

THE COMMISSIONER: 326.

6

--- EXHIBIT NO. 326: Binder containing reports  
prepared by Dr. Nadas.

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12

MR. LAMEK: Q. Just for a  
moment, looking, Dr. Buehler, at the blank form if  
you will, starting at the page numbered 1 of the  
binder, can you tell me who devised the form and  
the questions on this that Dr. Nadas was required  
to complete?

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A. We worked on this together.  
I drafted the initial form and then at the time  
Dr. Nadas arrived we worked with him in developing  
the particular scores.

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Q. Right.

A. As far as status was con-  
cerned, Dr. Nadas felt that three scores would be  
appropriate and that the terms he used were satis-  
factory, intermediate and critical.

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In terms of prognosis the three  
terms he used were good, guarded and poor.

Q. Good, guarded and...?

A. Poor, yes.

In terms of the timing of the child's





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(ANSWERS BY DR. BUEHLER)

death, this dealt with whether or not when a child died fit with the child's condition at the time of death, and there are three categories. First, expected and consistent with clinical status, unexpected but consistent with clinical status, and lastly, unexpected and inconsistent with clinical status.

In terms of the nature of the terminal events we, when we drafted the form, had two categories. Dr. Nadas felt that a third should be added so that we had inconsistent with digoxin intoxication, consistent with digoxin intoxication and consistent with special concern, the latter category being those deaths Dr. Nadas had special concerns that death may have been due to digoxin intoxication as judged by the clinical pattern of death.

Lastly we attempted to address the issue of whether or not the child should have been receiving a higher level of care, and in addressing this issue Dr. Nadas cautioned that his assessments were based on the standards at his hospital which differed from the standards at The Hospital for Sick Children in that the hospital where he was the





G4

(ANSWERS BY DR. BUEHLER)

former Chairman of Cardiology has a much larger number of intensive care beds.

Q. In relation to the overall size of the hospital?

A. That is correct.

Q. Yes.

A. So that this is a relative score and he cautioned that it not be used as a judgment on the level of care or that it not be used, rather, as an assessment of the judgment of the physicians at the Hospital.

Q. Do I understand, and I need to be clear about this, that Dr. Nadas' completion of these forms reflected his assessment of the clinical picture of each child?

A. That is correct.

Q. And was Dr. Nadas furnished with any toxicological information, post mortem levels or anything of that sort of digoxin concentrations?

A. In our initial letter to Dr. Nadas I believe that we did send him some information on post mortem digoxin that had been presented at the preliminary hearing.







G5

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(ANSWERS BY DR. BUEHLER)

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Q. Yes.

4

A. But he did not use that  
information in forming his clinical assessments.

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Q. All right. He focused on  
what was in the charts I take it?

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A. That is correct.

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Q. Now we do know, though,  
that in some of the charts there is information as  
to post mortem digoxin concentrations. I think,  
for example, of Cook where assays were done at the  
Hospital immediately following the child's death.

13

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Where such information was con-  
tained in the chart do you know whether Dr. Nadas  
took it into account in preparing his report on a  
child?

16

17

A. I cannot tell you exactly  
what information Dr. Nadas looked at in each chart.

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22

Q. Okay. And finally with  
respect to Dr. de Sa, can you tell me briefly what  
was he asked to do, and I may tell you that his  
report is already marked as an exhibit in these  
proceedings although Dr. de Sa has not given  
evidence here.

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(ANSWERS BY DR. SMITH)

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A. Yes. Dr. de Sa -- we were





G6

(ANSWERS BY DR. SMITH)

presented with preliminary terms of reference by the Department of Pathology which we felt were fairly reasonable. We handed them to Dr. de Sa and Dr. de Sa felt that he was comfortable addressing each of the issues and went on to do so by reviewing the autopsy reports and slides of those individuals during the epidemic period on whom autopsies had been performed.

Q. Yes. As a matter of curiosity can you tell me, please, why his report was submitted separately?

A. As I remember his report had no contentious issues in it and we felt that it should not be held back anticipating that there might be a problem with our report once it was received.

Q. I see.

A. We felt that the Pathology Department had been very eager to have an external accessor and that part at least should not be held back.

Q. All right. Did that report, the de Sa report, go to the Hospital?

A. Yes, it did.





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(ANSWERS BY MR. SMITH)

MR. LAMEK: All right. I want to come back to the particular reports of the consultants later, but first I want to get back to the sequence of your investigation.

Is this, Mr. Commissioner, an appropriate time to take the morning recess?

THE COMMISSIONER: Yes. We will take twenty minutes.

--- recess.







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--- Upon resuming

THE COMMISSIONER: Yes Mr. Lamek?

MR. LAMEK: Thank you, sir.

Q. Before we move on can we just go back to something you said immediately before the break Dr. Smith. That was - you told me that Dr. de Sa's report had been provided to the hospital. Can you tell me when and where that occurred?

(ANSWERS BY DR. SMITH)

A. Approximately a month or so after the main report was - well, both reports were given to the Ministry. There was a meeting between the Attorney General, his representative, the Deputy Minister and representatives of the hospital as to whether or not they should receive a full report. At that meeting specific mention was made of the Pathology Report, and as I remember the report was given to the hospital at that time.

Q. Was Dr. Phillips at the meeting?

A. He was not at that meeting, no.

Q. Now, coming back to the sequence of the investigation; from page 7 of the report and for a number of pages following that there is reference to a number of studies of different elements and aspects of the affair. I would take it that certain of





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(ANSWERS BY DR. SMITH)

those studies were probably going on at the same time, proceeding in parallel, but generally does the report set out the studies that were conducted and the course of your investigation in a more or less chronological sequence?

A. It is more or less chronological but there is some overlap, yes.

Q. Yes. When we get to page 7 you are reporting upon your examination of: "ward conditions and features of cardiac population". For what purpose was that study undertaken?

(ANSWERS BY DR. BUEHLER)

A. After noting that there was an increase in the mortality rate on Wards 4A and 4B we attempted to look at a wide variety of different aspects of patient care and patient population to attempt to give us any clues or ideas that might explain why an increase in mortality had occurred.

Q. And what was the significance of this particular enquiry: "ward conditions and features of cardiac population"?

A. As outlined we looked at a variety of different parameters of features of care, ranging from bed occupancy rates to nursing patterns





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(ANSWERS BY DR. BUEHLER)

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to the number of procedures performed, geographic referral patterns for surgical patients, but in general we didn't come up with anything that stood out as an important change except for one aspect and that was occupancy rates in the intensive care units.

Q. Could we come to that in just a moment Doctor?

A. Yes.

Q. Can you tell me first please, forgive me, some of these questions are awfully simple minded, why were you concerned to establish occupancy rates either in the ward or anywhere else in the hospital, what was the purpose in establishing occupancy rates?

A. For example, if there was a sharp increase in the occupancy rate on the cardiology ward that may have placed some stress on the delivery of services.

Q. Okay. I take it then it was for that same reason you were interested in looking at nurses' workloads, availability of nursing staff and so on, to see whether for one reason or another the care resource may perhaps have been stretched a bit thin at particular times, and this may have had an







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(ANSWERS BY DR. BUEHLER)

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effect on the quality of care that was able to be  
provided?

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A. That is correct.

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Q. Now when you refer to the  
nursing workload and the relative availability of  
nursing staff, you report on page 7 that you used:

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"... data from a scoring system  
employed by the nursing administration  
to plan both daily and long-term  
nursing assignments."

12

Is that we have heard referred to as the NARvel  
scoring system?

13

14

A. Yes, it is.

15

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Q. Which is an assessment as I  
understand it of the amount of care that will be  
required by each patient on the ward and therefore  
the total floor population?

18

A. That is correct.

19

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Q. Now, the final sentence of that  
second paragraph on page 7, says:

21

"These ratios ..."

22

That is to say the NARvel scores:

23

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"... are computed only for nursing  
person-hours available on the 0730-  
1930 hours shift."

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(ANSWERS BY DR. BUEHLER)

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Was NARvel scoring not done for the night shift at all  
or were records just not available?

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A. There is two parts to the NARvel  
evaluation.

6

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Q. Right.

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A. One is the actual assessment of  
time required for care of the child. The second is  
the calculation of the ratio which is the ratio of  
time required to nursing hours available.

11

Q. Right.

12

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A. That ratio was calculated only  
for nursing hours available on the daytime shift.

14

15

Q. Was the first assessment made  
with respect to nighttime shift as well?

16

17

A. That assessment was made each  
night in anticipation of nursing needs the following  
day.

18

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Q. Was it made during the day in  
anticipation of nursing needs for the night?

20

A. No.

21

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Q. Were there any data available to  
you, any data of any kind available to you, any data of  
any kind available to you upon which you could form a  
judgment as to the sufficiency of nursing staff on the





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(ANSWERS BY DR. BUEHLER)

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cardiology wards on the night shift?

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A. Not in terms of this ratio.

5

Q. Were there other kinds of  
information that were available?

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A. (Dr. Wallace): There is a  
nursing assignment book and we did review this book  
and we noticed that on several occasions nurses had  
been sent from the cardiology wards to other wards in  
the hospital leaving one to suspect that they had  
adequate coverage.

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Q. Was there anything else that  
led you to form any judgment as to the adequacy of  
the nursing resources that were on at night?

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(ANSWERS BY DR. SMITH)

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A. In reviewing the nursing  
assignment books there were many instances as well,  
not only when nurses were shifted out of the wards to  
other more needy wards, but where nurses were  
transferred in because the ward needed them. We did  
not take account of these events but it was our over-  
all impression that if nurses were needed they would  
be transferred in.

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Q. Tell me, do epidemiologists  
concentrate solely upon objective data, or are you also







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(ANSWERS BY DR. SMITH)

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interested in subjective impressions, subjective  
impressions of other people as a source of infor-  
mation?

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A. Yes, we are interested in  
subjective opinions as well as objective data,  
primarily objective data. Sometimes objective data  
are helpful in formulating questions.

9

10

Q. Did you make any enquiry to  
ascertain if there was any perception of inadequate  
nursing coverage on the wards at night?

11

12

(ANSWERS BY DR. WALLACE)

13

A. As far as we know there were  
no complaints from the nursing staff themselves that  
they were understaffed.

15

16

Q. At the time you were considering  
these questions of the nursing workload and the  
availability of nursing staff and so on, were you  
aware at that time that in the epidemic period there  
was apparently a clustering of deaths in the hours  
between midnight and 6:00 a.m.?

20

(ANSWERS BY DR. BUEHLER)

21

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A. I am sorry, could you state  
your question again?

23

24

Q. Yes. At the time you were doing

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(ANSWERS BY DR. BUEHLER)

this part of your work, assessing the nursing workload, relative availability of nursing staff, were you at that time aware that in the epidemic period there appeared to have been a clustering of deaths between midnight and 6:00 a.m. on the cardiology wards?

A. Yes we were.

Q. We have heard here from Dr. Rowe and others that the staff cardiologist at the hospital had the impression that there was a shortage of nurses on the cardiology wards at night. In the course of your interviews with the hospital staff, for example, that you have told me about, did you become aware of that impression, was that ever conveyed to you?

A. During our preliminary meetings with physicians at the hospital we were told that in the latter part of 1980 the hospital had a sense of, or an awareness that there was an increase in deaths on the cardiology service, that they had met with the physicians and with nursing administrators and there were a number of concerns that arose at that time. One of them was the adequacy of nursing coverage. Another was the adequacy of physician coverage. Another was the potential need for an intermediate level intensive care facility on the 4A/4B unit.





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(ANSWERS BY DR. BUEHLER)

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Our understanding from that was that there was an increase in the physician coverage; there was - plans were made to establish an intermediate level care unit. I am not clear as to what specific plans were made as far as nursing staff coverage at that time.

Q. Now so far as the population size on the cardiology wards was concerned, your conclusion is set out I think in the final sentence of the last full paragraph on page 7, is it not:

"And adjusted for number of beds the mean monthly admission rates were the same for the two wards and no relative increase or decrease in admission was associated with the epidemic period."

Is that the conclusion at which you arrived after considering occupancy rates both in and out of the epidemic period?

A. (Dr. Wallace): That is right.

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23jan84 2 (ANSWERS BY DR. BUEHLER)

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Q. And if therefore some increased occupancy rate might have produced some stretching of the available nursing or medical resources, that does not appear to have been existent here, there was no such increased occupancy rate that you were able to discern?

A. From the data we have, yes.

Q. From the data you had?

A. Yes. May I just amplify that slightly?

Q. Yes.

A. If you look at the second sentence in that paragraph.

Q. Yes.

A. "During the epidemic period (July 1980 through March 1981), the mean monthly occupancy rate for Ward 4A was 67.6%..."

I will exclude what is in the parentheses.

"...and for Ward 4B, 70.3%. For the July-March period..."

Q. I'm sorry, where am I looking, Doctor?

A. The second sentence of that





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(ANSWERS BY DR. BUEHLER)

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bottom paragraph on page 7.

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Q. I'm sorry, I had already  
moved on to something else. Yes.

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A. "...the mean monthly occupancy  
rate for Ward 4A was 67.6% and for  
Ward 4B, 70.3%."

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And then we look at that same occupancy rate for  
the July to March periods for the preceding years.  
For 1976-77 and 1979-80 those rates were, through  
1979-80, they were 76.3 per cent, 75.7 per cent,  
55.8 per cent and 58.8.

13

So it is clear that there were  
fluctuations in the occupancy rates.

14

15

Q. Yes.

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A. Yet at a time when there  
were similar occupancy rates we had not observed  
a similar increase in mortality and that is the  
basis for that conclusion.

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Q. Fine, thank you. You already  
explained to me I think the reason for considering  
and comparing the same block of nine months, that is  
to say, July to March in different years, to take  
account of any possibility of seasonal influences  
upon admissions and that sort of thing?





I3 1  
2 (ANSWERS BY DR. BUEHLER)

3 A. That is correct.

4 Q. Yes. You did conclude however  
5 that at the bottom of page 7 there was an increase  
6 in occupancy rates or high occupancy rates in the  
7 intensive care unit. You say:

8 "Occupancy rates in the ICU were  
9 generally high and often exceeded  
10 67% (the desired maximum occupancy  
11 rate expressed in intra-hospital  
12 memoranda)."

13 And that desired maximum rate  
14 was exceeded for all nine months during the epidemic  
15 period compared to approximately 80 per cent of the  
16 preceding 52 months?

17 A. Yes.

18 Q. What is the possible  
19 significance of that finding, where might that have  
20 led?

21 (ANSWERS BY DR. SMITH)

22 A. The possible significance of  
23 that is that because of the high occupancy rate in  
24 the ICU patients may have been discharged too early  
25 to wards.

Q. Yes.







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I4 2 (ANSWERS BY DR. SMITH)

3 A. Or, on the other hand, they  
4 may not have been accepted to the ICU when they  
5 needed to be transferred.

6 Q. And that I take it could  
7 give rise to the possibility that children who  
8 really were sick enough to be in the ICU because of  
9 pressure and space were in fact on the ward?

10 A. That is correct.

11 Q. And I take it at greater risk  
12 of death because of their condition?

13 A. Correct.

14 (ANSWERS BY DR. BUEHLER)

15 A. I would hasten to add however  
16 that for 42 of the preceding 52 months nearly four  
17 out of five in that condition were also present.

18 Q. Yes. Indeed, high occupancy  
19 rates in the ICU appears to be a fairly constant  
20 fact of life at the Hospital in the period that you  
21 examined?

22 A. It seemed to be a common  
23 problem that was more common during that nine-month  
24 period.

25 Q. Yes. But nevertheless, the  
high occupancy rate in the ICU in this period could have





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(ANSWERS BY DR. SMITH)

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contributed in some way to the increased mortality rate on the wards and that is I take it something that you had to consider and to examine and decide one way or another if you could?

A. That is correct.

Q. How did you determine if the high occupancy rate in the ICU did indeed have any effects on the ward mortality rate?

A. One of the assessments which we asked Dr. Nadas to make, one of the clinical assessments was to advise us on whether a particular patient should have received a higher level of care, should have been transferred to the ICU as we put it in the questionnaire but his interpretation of that was, should receive a higher level of care.

Q. All right. Now, I must tell you that my review of the Nadas material as contained in the binder that we have made an exhibit tells me that it was his view that 12 of our 36 children should have been in the ICU at, and I assume he means immediately before the time they died. They were Cook, Dawson, Estrella, Fasio, Floryn, Gage, Gardner, Hines, Inwood, Miller, Thomas and Warner.

MR. STRATHY: Could we have that once over slowly, please.





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MR. LAMEK: Yes, of course. I assumed everybody had done the same analysis. Cook, Dawson, Estrella, Fasio, Floryn, Gage, Gardner, Hines, Inwood, Miller, Thomas and Warner. So it appears that we have Dr. Nadas saying of the 36 deaths with which we are concerned 12 of those children in his view should have been in the ICU. Now, there is only one child in our 36 who died in the ICU and that was Pacsai and Dr. Nadas did not say in his report that he thought -- he thought Pacsai should have gone there earlier. Fully a third of the group of 36, according to Nadas, should have been in the ICU at the time they died.

Q. Did you regard that opinion as an indicator that the busyness of the ICU in the epidemic period may indeed have contributed to the increased ward mortality rate?

(ANSWERS BY DR. BUEHLER)

A. To answer that, let me direct you to Table 7.

Q. Yes.

A. Because I think that it is very important to keep in mind that Dr. Nadas' assessments were performed to compare children who







Smith, Buehler  
Wallace, Kusiak  
dr.ex. (Lamek)

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(ANSSEERS BY DR. BUEHLER)

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died at one time to those children who died at  
another.

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Q. All right. Table 7 occupies  
two pages I think.

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A. Yes. We are looking at the  
second page of Table 7, the last table on that page.

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Q. That is Higher Level of Care  
Desired?

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A. That is correct.

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Q. Yes.

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A. And in addition I think it  
is important to emphasize that Dr. Nadas' scores  
are based on the standards at his hospital and  
therefore shouldn't be directly applied to the  
standards at this Hospital, at The Hospital for  
Sick Children.

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Q. Yes.

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A. If you look at Table 7, and  
I will direct you to the subtotal of pre-epidemic  
and post-epidemic patients, six of 20 patients  
who died before or after the epidemic period, in  
other words, 30 per cent, had a similar score. So,  
our interpretation of that is that in judging the  
population of deaths, the population of deaths during





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(ANSWERS BY DR. BUEHLER)

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the epidemic period as a group did not differ in  
that regard from the population of children who  
died during the comparison times.

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Q. Okay, you are saying that  
on Dr. Nadas' review, whether he is looking at  
children who died during or outside the epidemic  
period, he says in 30 to 33 per cent of all cases  
to have been of the view that the child should  
have been in the ICU at the time he died?

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A. Yes.

12

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Q. Okay. And there is nothing  
unusual in that respect in the epidemic period?

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A. That is correct.

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A. I would like to add to that  
as long as we are on the issue of the ICU that if  
admission to ICU or limitation of admission to ICU  
contributed to the epidemic, there are certain  
patterns that you might expect that differ from the  
patterns we observed, and I think we will get to that  
in later testimony.

21

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Q. Well, if I don't you be sure  
that you do, Doctor, thanks.

23

(ANSWERS BY DR. WALLACE)

24

A. Could I just add something?

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I9 2 (ANSWERS BY DR. WALLACE)

3 Q. Yes.

4 A. A test of statistical  
5 significance giving this P value of .97, that is  
6 not significant.

7 MR. OLAH: I'm sorry, Mr. Lamek,  
8 but when the last witness speaks it is very difficult  
9 to hear her.

10 MR. LAMEK: I'm sorry, if you could  
11 move the microphone a little.

12 DR. WALLACE: I'm sorry.

13 MR. LAMEK: I think that will be  
14 of great help, Dr. Wallace.

15 Could you say again what you just  
16 said, please.

17 A. If you do a test of statistical  
18 significance on the data given in that table the  
19 P value of .97 is not significant.

20 Q. All right. And that is a view  
21 that a resident statistician would share, is it?

22 A. (Mr. Kusiak) That is true.

23 Q. Yes, all right.

24 THE COMMISSIONER: Could we have  
25 some definition of all of these terms? I would  
like to just have a glossary and I don't think there







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one. What does SD stand for?

MR. KUSIAK: Standard Deviation.

THE COMMISSIONER: Standard deviation. What does it mean?

MR. KUSIAK: It is an indication of the variability in the data. Is that clear? It somehow measures data or there are uncertainties or variability in data and it somehow gives an idea of how variable the data is. A larger standard deviation indicates that there is a greater variance.

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THE COMMISSIONER: Can you just tell me where you get it, where you get the standard deviation?

MR. KUSIAK: Well, one can estimate it based on population - on observed data.

For instance, in this case we are looking at occupancy rates on a monthly rate on a ward.

THE COMMISSIONER: Yes.

MR. KUSIAK: One would have these figures for a number of months and one can use formulas to calculate a standard deviation if one makes the assumption that the occupancy rates follow a certain kind of statistical distribution.

THE COMMISSIONER: The problem I am having - let's look at page 7. The second line under "Results":

"During the epidemic period ... the mean monthly occupancy rate for Ward 4A was 67.6%".  
The standard deviation was 7.7%.

Now what does that mean? Let us take August or September; it would what, go up or it would go down 7.7%?

MR. KUSIAK: What it means, the specific --





J.2

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THE COMMISSIONER: What is the standard?

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MR. KUSIAK: What it means specifically  
is that if I took twice, two times the standard  
deviation, roughly two times --

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THE COMMISSIONER: Yes.

7

MR. KUSIAK: In other words 15.4.

8

9

10

11

12

13

THE COMMISSIONER: 15.4.  
MR. KUSIAK: Added that and subtracted  
that to the 16.7 -- the 67.6 mean, then 95% of the  
values that I used to calculate the standard deviation  
would be within that range. Only 5% would be further  
away. So you can see that the smaller, that is the  
tighter the spread of the data, the more concentrated  
the data is --

14

15

16

17

THE COMMISSIONER: 95% would be plus  
or minus the mean; is that right? 95% would be plus  
or minus the amount of double the standard deviation,  
plus or minus the mean, over, above --

18

19

MR. KUSIAK: You would take the  
standard deviation, double it.

20

21

22

23

24

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THE COMMISSIONER: Double it.

MR. KUSIAK: And add it to the mean  
and then subtract it from the mean and you would  
get two numbers. You would get the mean plus two  
standard deviations.







J.3

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2

THE COMMISSIONER: Yes.

3

4

MR. KUSIAK: And minus two standard deviations and that would give you the range, the 95% range.

5

6

THE COMMISSIONER: What is the value of that to us?

7

8

MR. KUSIAK: Well, it would indicate that sometimes the occupancy rate could be quite high.

9

10

THE COMMISSIONER: Yes.

11

MR. KUSIAK: Or it could be up to 67.7 plus 15.4%.

12

THE COMMISSIONER: Around 83 or something like that?

13

14

MR. KUSIAK: Yes. And other times it could be - you know, infrequently it could be quite low. But it gives an idea of how variable these data are.

15

16

17

THE COMMISSIONER: Yes. Those are calculated from the actual figures I take it. You take the actual figures on the ward?

18

19

20

MR. KUSIAK: That is true.

21

22

THE COMMISSIONER: That would give us the mean but you are also giving us this standard deviation so we know just how much it does vary?

23

24

25

MR. KUSIAK: That is right.





J.4

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2

THE COMMISSIONER: Is that the idea?

3

MR. KUSIAK: That is right.

4

THE COMMISSIONER: All right. That  
is one of my problems. I will have others.

5

6

Rather than use the term "range" -

7

of course the range will obviously mean the  
range from the bottom to the top I take it? - why do  
you use "range" some times and "standard deviation"  
other times?

9

10

MR. KUSIAK: The standard deviation  
is calculated on the assumption that the data follow  
normal distribution, common distribution used in  
statistics.

11

12

13

14

In some cases examining the data  
would show that this is not the case, and in an  
attempt to get an idea how variable the data are  
one uses a range. This gives the complete  
variability of the data.

15

16

17

18

THE COMMISSIONER: Yes. All right,  
thank you.

19

20

MR. LAMEK: I rather hoped, Mr.  
Commissioner, you were going to ask for an  
explanation of the final paragraph before "B. Results"  
on page 7 because I haven't dared. The one that  
talks about chi-square test, frequency in a cell,

21

22

23

24

25





J.5

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2

Fisher exact test. I think I will leave that to a  
braver soul than I.

3

4

MR. ORTVED: The Commissioner knows  
all that.

5

6

MR. LAMEK: Probably, yes.

7

8

THE COMMISSIONER: You could send a  
small stated case to the Divisional Court.

9

10

MR. LAMEK: Am I entitled to assume  
that I know what this means?

11

12

Q On page 8 of the report you  
consider the question of procedures, surgical  
procedures and referrals, surgical procedures  
including cardiac catheterizations.

13

14

Can I look at the question of  
referrals, please, and particularly referrals from  
cardiologists in Manitoba.

15

16

Why were you concerned to examine  
that situation?

17

18

(ANSWERS BY DR. WALLACE)

19

20

A. It had been suggested to us by  
members of the Cardiology Department that you were  
having more referrals at that time which were making  
greater demands on the services of the cardiology  
unit.

21

22

23

24

Q In light of your conclusion

25

26







J.6

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2

(ANSWERS BY DR. WALLACE)

3

that the occupancy rate did not vary significantly  
4 from prior periods did it matter where the patients  
5 were coming from?

6

7

A. No, I don't think so. However,  
we did address the question because they had a strong  
impression that this was affecting their service.

8

Q. And what did you conclude?

9

10

A. Well, as we have stated on the  
report a number of these referrals was relatively  
constant throughout '81.

11

12

Q. And does not, therefore, appear  
to have been a contributing element to the increased  
mortality rate?

13

14

A. That is right.

15

16

Q. And in studying surgical  
procedures what was your purpose?

17

(ANSWERS BY DR. BUEHLER)

18

19

A. This issue, we were attempting  
in a rough way, and I am emphasizing "rough way" to  
describe the complexity of heart surgeries that were  
being performed.

20

21

22

In our interview with the Chairman  
of the Hospital Surgery Department, Dr. Trusler, we  
asked him if he thought using the duration of surgery

23

24

25





J.7

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(ANSWERS BY DR. BUEHLER)

3

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was acceptable as a crude index of the complexity of the surgical procedures, and he agreed. Therefore we looked at the per cent of surgical procedures that lasted longer than four hours. But I think it should be kept in mind that that is certainly a crude index of the complexity of surgical procedures being performed.

9

Q. Yes.

10

11

12

A. And again in examining that, we didn't see a sharp increase in the per cent of those procedures coincident with the academic period.

13

14

15

16

17

Similarly in reviewing the log books of the Surgery Department we realized that a number of surgical procedures are performed and that some of those are relatively simple procedures that have a lower risk, particularly pacemaker procedures and ligation of patent ductus arteriosus.

18

Q. Yes.

19

20

21

22

23

24

25

A. So we examined whether or not there was a relative increase or decrease in the percentage of total procedures represented by those two procedures which are relatively lower risk procedures as judged by the cardiologists, and similarly the finding there was that no, there wasn't





J.8

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2

(ANSWERS BY DR. BUEHLER)

3

a sharp change of the per cent represented by those  
procedures coincident with the epidemic period.

4

5

Q. And that therefore did not  
appear to be a candidate for a contributing cause to  
the mortality rate?

6

7

A. Yes.

8

9

Q. You also considered the incidence  
of Code 25 calls. You looked at those on a quarterly  
basis from January, 1979 to March, 1982.

10

11

What information was available with  
respect to Code 25 calls?

12

13

(ANSWERS BY DR. WALLACE)

14

A. The only information available  
was a log kept by the telephone operator.

15

16

Q. Internal telephone operator of  
the Hospital?

17

18

A. Yes. This was the source of  
data that we worked from on this.

19

20

Q. What information was contained  
in the log?

21

22

A. It simply contained the date  
and the time of the call and the ward to which it  
had been directed.

23

24

25

Q. Not the patient?







J.9

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2

(ANSWERS BY DR. WALLACE)

3

4

A. No, there was no patient  
identification.

5

6

Q. You record that in the nine-  
month epidemic period there were some 27 Code 25  
calls to the cardiology wards.

7

8

I understand you were working with  
what, 35 or 36 deaths in the period?

9

(ANSWERS BY DR. SMITH)

10

11

A. 56 altogether ward associated  
deaths. 36 in the epidemic period.

12

13

14

15

16

17

18

Q. 36? I tell you I am aware of  
5 patients who died on the ward in the epidemic  
period for whom there was a "do not resuscitate"  
order in effect and I believe on page 15 of your  
report you also say 5 of the 36 were classified as  
"do not resuscitate" about a little over a third of  
the way down the page, and those 5 as I recall it  
were Floryn, Heyworth, Leith, Murphy and Perreault.

19

20

21

22

23

24

25

I can only give you my best  
recollection, but my best recollection is there  
were resuscitation efforts on all the other children.  
I don't know whether you have similar recollection  
from your review of anything you took from the charts,  
but obviously the mathematics don't compute if I am  
right?





J.10

1

2

(ANSWERS BY DR. SMITH)

3

A. There may have been a resuscitation effort for which there was no Code 25 call. If the physicians were already on the ward --

5

6

Q. Right.

7

A. -- there might not have been a call put through to the operator.

8

9

Q. Were you satisfied that the data you received from the operator's log was complete and accurate?

10

11

(ANSWERS BY DR. WALLACE)

12

A. We had no way of knowing. We have to accept this data.

13

14

We did discover some inaccuracies in that she had used a 24-hour clock and had forgotten to change the date sometimes but --

15

16

Q. An easy thing to do, yes.

17

A. Minor things like that.

18

19

Q. Were you aware of any successful resuscitation attempts on the cardiology wards in the nine-month period?

20

21

A. We were aware of only one successful attempt in a child who subsequently died four days later.

22

23

Q. And this was Estrella?

24

25





J.11

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2

(ANSWERS BY DR. WALLACE)

3

A. Estrella I think.

4

DR. BUEHLER: May I amplify that answer?

5

MR. LAMEK: Q. Yes.

6

(ANSWERS BY DR. BUEHLER)

7

A. Later in the report we mentioned the Code 25 calls again and there were Code 25 calls for whom we could not identify the patient for whom the call was made.

10

Q. Yes.

11

A. Therefore there may have been more successful resuscitations.

12

Q. Correct.

13

(ANSWERS BY MR. WALLACE)

14

A. I think because the timing of the call did not roughly correspond with the timing of the death we would have to assume that these were --

17

Q. That there were more than likely some successful ones?

18

19

A. Some successful, yes.

20

Q. With respect to the item at the foot of page 8, nursing care, the conclusion insofar as you were able to express one seems to be in the second and third last sentences of the paragraph:

21

22

23

24

25







J.12

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(ANSWERS BY DR. WALLACE)

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"Within the epidemic period, deaths did not tend to occur on days with relative under- or over-staffing.

However, these data reflected staffing for the day shift only."

I understand from that language that it was your conclusion with respect to the day shifts at least any apparent under- or over-staffing of nurses did not appear to be a determinant of the occurrence of death? Is that one way of putting it?

A. (Dr. Buehler): That is correct.

Q. But there was no information upon which you could draw a similar or indeed a different conclusion with respect to the night shift?

A. That is correct.

Q. You then went on, on page 9, to consider how sick this ward population was. Having determined that it was not unusual in terms of its occupancy rate, you then went on to consider its relative degree of sickness. That is compared, of course, with non-epidemic period populations.

It was for this study, was it not, that you enlisted the aid of Dr. Rowe?

A. (Dr. Buehler): That is correct.





J.13

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Q. You furnished to him information about a large number of patients and you asked him to assess the severity of illness and the prognosis for each of those children?

(ANSWERS BY DR. BUEHLER)

A. Yes.

Q. Now Dr. Rowe has told us in the course of his evidence here, indeed he has shown us and we have marked as an exhibit, the nature and the extent of the information that was provided to him about any individual patient.

A. Yes.

Q. I understand that Dr. Freedom was also involved at one stage in this particular exercise, was he not? Can you tell me something about that, about Dr. Freedom's involvement, and whether it continued?

(ANSWERS BY DR. SMITH)

A. We initially engaged Dr. Freedom and Dr. Rowe to assess a sample of patients with standard categories that had been published in a large article in the New England Journal of Medicine. I believe in total there were 16 categories, an A, B, C, D classification through 1 through 4, and on a sample of patients they would give each patient an





J.14

1

2

(ANSWERS BY DR. SMITH)

3

A plus a number --

4

Q A letter and a number?

5

A A letter and a number. Their  
results varied considerably.

6

Q As between the children?

7

A From each other, yes.

8

Q Were they each doing the same

9

group of children?

10

A The same group of children.

11

Q And there was not a good

12

correlation between their two assessments?

13

A No, there was not.

14

There as I remember Dr. Rowe's comments  
were that there were - or rather our comments were  
that there were quite a few categories and that it  
might be perhaps better to collapse the categories  
somewhat to give a general description of the  
prognosis and clinical assessment of these children  
because the categories were too diverse.

19

20

Q And I guess with four letters  
and four numbers you had what, sixteen --

21

22

A Sixteen different possibilities  
so they would have had to be collapsed to make some  
general categories.

23

24

25







J.15

1

2

(ANSWERS BY DR. SMITH)

3

Q So were the categories therefore

4

broadened in some way?

5

A Dr. Rowe prepared a different

6

set of categories with criteria for each category,

7

and we proceeded to give him a sample of patients

8

that he would assess using the specific criteria

9

which were developed, and we at that point decided to

10

use only his assessment with a narrower range of

11

categories.

12

13

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Q. So after the categories were revised it was just Dr. Rowe who did the scoring?

(ANSWERS BY DR. SMITH:)

A. That is correct.

Q. Was it not desirable to have the scoring to continue to be done by two people for the sake of each checking out to see what kind of a correlation they would get?

A. Well, we felt Dr. Rowe as the Chairman of the Department would have -- would be the authoritative person to give us an opinion and with his having devised the criteria we felt that he could be relied upon to do this.

Q. Did you adopt any techniques to check on his own consistency with himself, or check on the validity of his rates?

A. No, we did not do any internal comparisons.

Q. Did Dr. Rowe ever complain to you that the information supplied to him for this purpose was insufficient to enable him to form a reasonable view of the child's severity of illness or prognosis?

A. He commented that in some instances it might not be sufficient and we did not use





1 (ANSWERS BY DR. SMITH:)

2 those cases where he could not make an assessment.

3 (ANSWERS BY DR. BUEHLER:)

4 A. In addition to that next to  
5 some of the assessments he placed a question mark to  
6 indicate that he was less certain. However, we in  
7 comparing our results used the value that he gave,  
8 for example, B would give a value of 2 or 3  
9 and he put a figure 2 and a question mark. We would  
10 use 2.

11 Q. But in some cases where  
12 he felt unable to explain any, he couldn't give it  
13 any score.

14 (ANSWERS BY DR. SMITH:)

15 A. That is right.

16 Q. There were some cases he felt  
17 unable to explain or give it any score.

18 A. That is right.

19 Q. And those obviously you could  
20 not use.

21 A. We did not use.

22 Q. Can you give me any idea of the  
23 approximate number of those?

24 A. I think we counted up about  
25 834 and there was some number between 830, between  
that and 870, perhaps that 30, I don't remember







1

2

(ANSWERS BY DR. WALLACE:)

3

A. I think the number was about 27.

4

THE COMMISSIONER: 27 what though?

5

Q. 27 Dr. Rowe felt he could not  
attribute a score on the information available.

6

(ANSWERS BY DR. BUEHLER:)

7

8

A. Before we deal with specific  
numbers in this part of the study, I think some  
problems in the analysis of this part of the study  
have been identified and I would like to address them  
at the appropriate time.

10

11

12

Q. Why don't we do it now, Doctor?

13

14

15

16

17

18

19

A. In doing this study our intent  
was to select a sample of patients who were admitted  
to the hospital before, during and after the epidemic  
period. Ideally it would have been desirable to make  
that selection based on the entire group of infants  
who started the hospitalization or who ended up at  
some time during their hospitalization on the cardiology  
ward.

20

21

22

23

24

25

However, based on the type of  
information that the hospital had we were only able  
to use for the study children who started on the  
cardiology, we were not able to include in our sample  
children who started for example in the NICU.





1  
2 (ANSWERS BY DR. WALLACE:)

3 We selected a group of patients for  
4 this study. In addition, we intentionally tossed into  
5 the study a number of patients who we were particularly  
6 interested in, who could not be included in the analysis  
of the samples. Those patients --

7 Q. I'm sorry, for what purpose were  
8 they put in?

9 A. I am sorry. Those patients were  
10 the children who died during the epidemic period and  
11 their surviving roommates, which we thought at  
12 some stage might be helpful for another part of  
13 the investigation. During the summer we gave our  
14 raw data on this part of the study to Dr. Brian  
15 Haynes from McMaster University. He reviewed our  
16 raw data and checked our calculations and observed  
17 that we made a mistake in the tabulation in this part  
18 of the study. His conclusion was that we included into  
the sample patients not only the sample patients but  
also the patients that we had hand picked.

19 Q. The seeded ones, as it were?

20 A. Yes. That information became  
21 available to Dr. Smith and Dr. Wallace, I believe, on  
22 Thursday or Friday, and to me on Friday night. We spent  
23 some time Saturday reviewing our data and we believed  
24 that Dr. Haynes judgment in that regard is correct.  
25





(ANSWERS BY DR. WALLACE:)

That indeed there were patients included in that analysis who should not have been included.

Dr. Haynes in his comment went on to describe the mistake we made and it appears that there was some misunderstanding on his part as to exactly who these seeded patients were.

Our conclusion from this part of the study was that the children who were admitted to the cardiology ward during the epidemic period represented a younger group of patients; they represented a group of patients who were more severely ill; they represented a group of patients who had less favourable prognosis for surviving hospitalization. We have not had an opportunity to in detail retabulate our findings, although we have no reason -- well, we have not had a chance to retabulate our findings in detail ourselves.

Dr. Haynes' tabulation led to somewhat different conclusions. Those conclusions were that; number 1, the children who were admitted to the hospital at this time were not younger, they were a population that was slightly more severely ill but not to the degree that we had observed, and not to a degree that was statistically significant; and they were not a population that was -- they were not







1 (ANSWERS BY DR. WALLACE:)

2 children who were more likely to have less favourable  
3 prognosis. In any event, that finding in no way changes  
4 the major conclusions of the report.

5 Q. Now, again to be sure I understand  
6 you: it appears that cases which you -- and I used  
7 the term "seeded" into this sample.

8 A. Yes.

9 Q. For a rather different purpose,  
10 you wanted them scored but for use in a different  
11 study.

12 A. That is correct.

13 Q. And which you intended to remove  
14 before the analysis was made.

15 A. That is correct.

16 Q. Were inadvertently left in the  
17 sample.

18 A. That is correct.

19 Q. Had the effect of making the  
20 epidemic period admissions appear to be younger as  
21 a group than in fact they were; sicker as a group  
22 than they in fact were; and with poorer prognosis  
23 than in fact they were, if Dr. Haynes be correct.

24 A. That is correct.

25 Q. And so the conclusions that are  
stated on page 10 in the third paragraph on the page,





1 (ANSWERS BY DR. WALLACE:)

2 are those conclusions which are drawn from the sample  
3 with the inadvertent addition of the seeded cases?

4 A. That is correct.

5 In addition, in the fourth paragraph,  
6 the paragraph that begins:

7 "The comparison of age, severity,

8 and prognosis ratings for 4-A and 4-B..."

9 Apparently Dr. Haynes did not repeat that part of our  
10 analysis, so we cannot comment on whether or not those  
11 conclusions are correct or not.

12 Q. Now, had your conclusions as  
13 stated in the second full paragraph on page 10 been  
14 correct, then I take it you would have been led to  
15 consider, as indeed you were, whether the younger,  
16 sicker population in the epidemic period contributed  
17 to the increased mortality rate?

18 A. That is correct.

19 Q. If Dr. Haynes be correct, your  
20 conclusions as expressed there are not valid, then  
21 does it follow from that that the sickness and  
22 prognosis and age characteristics of the epidemic  
23 population was not a contributing element in the increased  
24 mortality rate because there was no discernible dif-  
25 ference?

26 A. There was a very slight





1 (ANSWERS BY DR. WALLACE:)

2 difference in the percentage who were more severely  
3 ill; but yes, in general you are correct.

4 Q. You were proceeding on the  
5 basis of these conclusions and therefore had to  
6 consider whether the age, severity and prognosis  
7 characteristics of the epidemic population may have  
8 contributed to the increased mortality rate.

9 A. That is correct.

10 Q. Just one question, please, before  
11 we leave this study. Were you able to observe, or  
12 did the two reports not lend themselves to a comparison;  
13 were you able to observe any correlation between  
14 Dr. Rowe's scoring and Dr. Nadas' assessment of the  
15 patients?

16 A. I think it is important to  
17 highlight the differences in what those scores were.  
18 Dr. Nadas' assessment of severity was an assessment  
19 of severity of illness at the time the child was  
20 admitted to the hospital and it was based on a review  
21 of the hospital chart, undoubtedly looking at the  
22 child's condition when he or she arrived at the  
23 hospital.

24 In contrast, Dr. Rowe's severity  
25 assessments were based on the child's age and list of  
26 diagnosis at discharge. Similarly, the prognosis







1 (ANSWERS BY DR. WALLACE:)

2 scores differed. Dr. Nadas' assessment of prognosis  
3 was a more general statement of prognosis, again  
4 based on a review of the patient's entire hospital  
5 record.

6 Dr. Rowe's assessment of prognosis  
7 differed in that it was again based only on informa-  
8 tion that was available from the discharge summary,  
9 which again was age, discharge diagnosis and pro-  
10 cedures performed. His assessment was intended to  
11 address the issue, what was the prognosis for surviv-  
12 ing hospitalization. So to a certain extent, actually  
13 to a very large extent they are very different types  
14 of scores.

15 Q. And neither really serves to  
16 enhance the confidence level that you feel in the  
17 other?

18 A. I don't think we could make  
19 specific comparisons.

20 Q. Just one other thing before  
21 we leave the question of the error that you pointed  
22 out and the consequences of the correction of the  
23 error, should the assumption of Dr. Haynes be  
24 correct. The cases that you seeded into the sample,  
25 as you have told us, for scoring for a different  
purpose were cases of children who had died during the





1 (ANSWERS BY DR. WALLACE:)

2 epidemic period.

3 A. That is correct, and they were  
4 the children who died during the epidemic period and  
5 for each child the other children who were in the same  
6 room at the same time for those that we could  
7 identify.

8 Q. And the inclusion of those  
9 cases for the purposes of the analysis had the effect  
10 of making the epidemic population look younger, more  
11 severely ill and with poorer prognosis.

12 A. Yes.

13 Q. The removal of those cases, should  
14 Dr. Haynes be correct, makes them look less younger,  
15 less severely ill, with a less poorer prognosis.

16 A. That is correct.

17 Q. Does it follow from that that  
18 the seeded cases, the children who died, were  
19 generally younger, more severely ill and with a  
20 poorer prognosis than the sample population in the  
21 epidemic period that you selected for analysis?

22 A. Yes, that is true, the seeded  
23 patients included the children who died and their  
24 roommates.

25 Q. Yes.

(ANSWERS BY DR. SMITH:)





1 (ANSWERS BY DR. SMITH:)

2 A. Yes, I would like to emphasize  
3 that some of that seeded group included more survivors  
4 from the roommate group than it did actual patients  
5 who died.

6 Q. I take it if a child died, let  
7 us say, in 418, and four other children with him, you  
8 would include all five, would you?

9 (ANSWER BY DR. BUEHLER:)

10 A. That is correct.

11 (ANSWERS BY DR. SMITH:)

12 A. That is correct. So the overall  
13 inclusion of this group certainly changed the con-  
14 clusion in that study. I don't think that we can  
15 say --

16 Q. You can't attribute that just  
17 to the condition of the children who died.

18 A. Exactly, because there was a  
19 large contribution of those who in fact survived.  
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22  
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Q Survived, thank you. So, at this stage you have compared the ward populations in the epidemic and non-epidemic periods for severity, prognosis, age; age I take it being an important consideration in prognosis?

(ANSWERS BY DR. BUEHLER)

A. Yes.

Q Because we have heard here that young patients with congenital heart defects, if they are at risk of death tend to die within the first year of life. You then went on to compare the deaths in the epidemic period with the deaths outside the epidemic period. Is there some distinguishing feature or common characteristic, either way you like, between the children who died in this period and those who died at other times? Is there something different about this group? Is that what we are really looking for?

A. That is correct.

Q And this was a study, as I understand it, which required the help of your consultants, Dr. Nadas and Dr. Kauffman?

A. Yes. To be precise, however, Dr. Kauffman's assessments were only performed on the 36 who died during the epidemic periods.





L. 2

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(ANSWERS BY DR. BUEHLER)

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Q. Right.

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A. So therefore Dr. Kauffman's

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assessments could not be used in comparing epidemic  
to non-epidemic deaths since he didn't in general  
look at non-epidemic deaths.

6

7

Q. Now, was the object of this

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exercise to determine if you could with the assistance  
of Dr. Nadas whether the children who died in the  
epidemic period were more severely sick than those  
who died outside the epidemic period?

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A. Yes. One of the questions we

13

asked Dr. Nadas to address was severity of illness  
at time of admission. So, we were able to ask the  
question: was this group of children more severely  
ill when they entered the Hospital compared to  
children who died at other times?

14

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Q. Because at the time you were

18

doing this study you believed on the basis of your  
earlier conclusion that the overall population in  
the epidemic period was more severely ill than  
children in other periods?

19

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21

A. I don't recall precisely whether

22

or not we had completed our analysis of the other  
study. The general question of severity was one we

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L.3

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(ANSWERS BY DR. BUEHLER)

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would have asked regardless of that issue.

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Q. Okay, fine. So, were the children who died in the epidemic period more severely ill than those who died at other times is an important question in your study, I take it?

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A. Yes.

Q. All right. Can you help me with something if you would, please, at the bottom of page 10 under:

"IV. Comparison of Epidemic-Period Deaths to Deaths in Other Periods.

"A. Methods.

"Although questions of digoxin intoxication and overdose were central, it was not possible to formulate a case definition based on digoxin levels for two reasons."

Can I pause there?

A. Yes.

Q. Could you define case definition, please, what does that mean?

A. In an epidemiologic study of this type it is often useful to define a case of illness. I think it would be easier to answer in terms of analogy.







L.5

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(ANSWERS BY DR. BUEHLER)

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Q. Fine.

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Q. Right.

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Q. Okay. How then did you - what was your case definition for this study then?

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A. Not being able to define digoxin intoxication precisely we decided to ask a different question. The question that we decided to ask was: is the population of children who died during this nine-month period, the population of deaths, all the deaths, are the characteristics of this group of





L.6

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(ANSWERS BY DR. BUEHLER)

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children who died during these nine months different

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from the characteristics of children who died at

5

other times. That is the question that we were

6

attempting to answer.

7

Q All right.

8

THE COMMISSIONER: Would this be a  
good time?

9

MR. LAMEK: Yes indeed, Mr. Commissioner.

10

THE COMMISSIONER: Until 2:30 then.

11

--- Luncheon adjournment.

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1  
2 ---Upon resuming.

3 THE COMMISSIONER: Yes, Mr. Lamek.

4 MR. LAMEK: Q. We were beginning to  
5 deal with the study which is covered from the bottom  
6 of page 10 and following pages in your report.

7 "Comparison of epidemic-period deaths  
8 to deaths in other periods."

9 On page 11 of the report there is the first reference  
10 to a subdivision of the general category of cardiology  
11 associated deaths and there are a number of different  
12 headings. Can you help me please as to why you  
13 thought it was appropriate or necessary to make those  
14 subdivisions?

15 (ANSWERS BY DR. BUEHLER:)

16 A. We divided deaths into several  
17 different categories. We were interested in distinguish-  
18 ing between deaths that might be related to events on  
19 the ward as opposed to deaths that might be related  
20 to events in the operating room.

21 Q. Yes.

22 A. In the broadest sense the  
23 cardiology associated deaths were all deaths during  
24 this three year period in which the patients spent  
25 part or all of their admission on the cardiology ward.  
Those cardiology deaths were further subdivided into







(ANSWERS BY DR. BUEHLER:)

four categories which in turn were aggregated into two categories. Those were ward deaths and post ward ICU deaths; in other words, if a child died on the ward or if a child deteriorated and subsequently died in the ICU they belonged to this ward associated category.

Similarly, if a child died in the operating room, an OR death, or in the ICU, after leaving the operating room, those categories were designated as OR associated deaths.

Q. Was there some maximum time interval between the transfer from ward to ICU that would qualify a death for post ward ICU death?

A. No. In other words, the child might deteriorate and be transferred to an ICU and die shortly thereafter or several days later. That would still qualify as a post-ward ICU death.

Q. Okay. And in that same paragraph you refer to the reference time.

A. Yes.

Q. It is referred to in two successive sentences. Halfway through the paragraph:

"For ward-associated deaths, exposure to medications and contact with ward





1 (ANSWERS BY DR. BUEHLER:)

2 personnel were determined in relation  
3 to the onset of terminal events. The  
4 reference time was defined as the time  
5 of call for resuscitation or emergency  
6 attention preceding death (for ward  
7 deaths) or preceding transfer from the  
8 ward to the ICU (for post-ward ICU  
9 deaths)."

10 I am not exactly clear from those two adjacent  
11 sentences just what the reference time was. Was it  
12 the onset of terminal events or was it the call for  
13 resuscitation efforts or did you treat those two as  
14 the same thing?

15 A. In effect, we treated them as  
16 the same thing.

17 Q. Although they may not necessarily  
18 be quite the same thing, may they?

19 A. Well, it was important to have  
20 a time that we could identify with clarity.

21 Q. Yes.

22 A. And in general the time that  
23 the nurse or other ward personnel issues a call for  
24 help is usually very well documented in the hospital  
25 chart, whereas a child's deterioration may not be as  
easily definable in terms of exactly when that began.





1  
2 (ANSWERS BY DR. BUEHLER:)

3 So, for our purposes we felt it was important to have  
4 a time that we could determine relatively precisely.

5 THE COMMISSIONER: In some cases, Doctor,  
6 there was a code 23 as well as a code 25. I know code  
7 23 is just for the doctors.

8 DR. BUEHLER: Right.

9 THE COMMISSIONER: Did you count that  
10 as the call for help or the code 25?

11 DR. BUEHLER: In general, we counted --  
12 if there was a code 23 that preceded the code 25 we  
13 counted the code 23 as the time. Quite often the  
14 code 23 and code 25 were separated by a very brief  
15 interval.

16 THE COMMISSIONER: Yes, all right.

17 MR. LAMEK: Q. And indeed, as you  
18 pointed out this morning, there may not have been a  
19 code 25 as such called; if code 23 were called and the  
20 doctor were there and the child deteriorated further,  
21 there may or may not have been a code 25 called but  
22 resuscitation efforts started.

23 (ANSWERS BY DR. BUEHLER:)

24 A. That's right, that is correct.  
25 That's why we worded that as time of call for emergency  
attention which could have been a 23 or a 25.







1  
2 (ANSWERS BY DR. BUEHLER:)

3 Q. Right. Now, in the next  
4 paragraph, at the beginning of the paragraph you refer  
5 to the abstraction of information from hospital charts  
6 in a format suitable for computer analysis. We have  
7 bound and distributed two forms of documents. We have  
8 numbered 1, although I understand at the point of time  
9 it was prepared later, a form for the case control  
10 study and as number 2 in the binder, although I under-  
11 stand this was the original preparation, a form headed  
12 Cardiac Death Investigation.

13 Could you first identify those two  
14 documents and we will mark them.

15 A. Yes.

16 THE COMMISSIONER: Which is going in  
17 first?

18 THE COMMISSIONER: Oh, they are bound  
19 together all right.

20 MR. LAMEK: "Data Sheets used in the  
21 preparation of the 'Atlanta Report'."

22 THE COMMISSIONER: That is 327?

23 MR. LAMEK: Yes.

24 ---EXHIBIT NO. 327: Brief entitled "Data Sheets used  
25 in the preparation of the 'Atlanta  
Report'."

MR. LAMEK: Q. Can we turn to the second







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(ANSWERS BY DR. BUEHLER:)

tab first, "Cardiac Death investigation". Can you tell me for what purpose this form was devised?

A. This form was devised so that we could have a uniform way of recording information about deaths during the time period we were interested in studying. It was for the purpose of abstracting hospital charts.

Q. And calls for the supplying of a wide variety of information: racial background of the patient, how the child arrived at the hospital, by ambulance, helicopter and so on, under the tunnel from the Toronto General, non-cardiac anomalies that were present, a host of questions about the clinical condition and diagnoses, birth information in item 3 on page 5 of the report and information as to the mother, information as to the hospital course and diagnostic studies performed, information as to surgery, type of death and so on, medication, route of administration, time of administration.

Was it the intention in preparing this form or questionnaire to obtain wherever possible any and all information which had occurred to you might possibly form any kind of a link or connection or common feature between the children who had died in





(ANSWERS BY DR. BUEHLER:)

the period?

A. Yes.

Q. You tried to cover the waterfront with all possible variations and elements and factors.

A. Yes, that is correct.

Q. Now, who actually did the abstracting of the information from the charts and completed the forms?

A. The three of us plus Dr. Madeline Harris.

Q. And how many charts were so abstracted?

A. (DR. SMITH) 134 for the death/death comparisons.

(ANSWER BY DR. BUEHLER:)

A. 142.

A. (DR. SMITH) I'm sorry, 42.

Q. That was quite a task. And what was the purpose, please, for the other form, the case control study form?

(ANSWERS BY DR. BUEHLER:)

A. That form was from a subsequent study we did where we looked at children who died and compared them to other children who were in the same room





(ANSWERS BY DR. BUEHLER:)

at the time that they deteriorated.

Q. That was the roommate study?

A. The roommate study, correct.

Q. Why are there two different forms and why are they different?

A. They differ in that the second form, which is the first in the binder.

Q. Yes.

A. Is considerably shorter. There were more specific questions to ask in the latter study than in the first. We had focussed our sights, therefore, we asked fewer questions.

Q. All right. And staying just for the moment very briefly with page 11 of your report. We have already this morning referred to the kinds of assessment that Dr. Nadas made of the children on the basis of the charts and it is pointed out on page 12, as we discussed again this morning, the impressions were clinical impressions and did not include a review of forensic digoxin findings, although we are not able to be sure whether Dr. Nadas in fact considered those post mortem digoxin concentrations which may have been found in the charts themselves.

A. That is correct.







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(ANSWERS BY DR. BUEHLER)

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Q. And then as you told us again this morning Dr. de Sa's objectives and so on were set out as were Dr. Kauffman's in your report.

Now when we come to page 13 we have I think for the first time an identification of the categories of deaths. They are set out under three categories. I just want to be sure as to the criteria for inclusion in each category.

Category A it seems has four criteria, the satisfaction of any one of which will qualify the death for inclusion in that category.

Is that so?

A. Yes.

Q. And therefore inclusion in Category A may reflect a score of 3 or greater than 3 on the 1 to 5 digoxin scale of Dr. Kauffman, and having heard his evidence I think it is fair to say he regards those as fairly compelling cases of digoxin intoxication related deaths, or it may merely indicate that the timing of death was considered to be unexpected and consistent with clinical status?

A. Unexpected and inconsistent.





BB2 2 (ANSWERS BY DR. BUEHLER)

3 Q. I'm sorry, is that not what I  
4 said?

5 A. You said unexpected and  
6 consistent.

7 Q. I am sorry, unexpected and  
8 inconsistent with clinical status, which I take it  
9 is a rather less -- wrong way of putting it -- perhaps  
10 a rather less compelling criteria than the 4 or 5  
11 rating on the Kauffman scale as indicating some  
12 possible digoxin involvement?

13 A. It is certainly a very  
14 different type.

15 Q. Yes. Well Category A covers  
16 potentially a range of levels of suspicion, if I  
17 may put it that way --

18 A.. Yes.

19 Q. -- recognizing that  
20 "suspicion" is not particularly a medical word.  
21 A range of criteria of more or less compelling  
22 nature.

23 A. Right.

24 Q. Is that fair?

25 A. Category A includes those  
deaths where one of the three consultants used the





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BB3<sup>2</sup>

(ANSWERS BY DR. BUEHLER)

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extreme scores available to him in assessing that death.

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Q. Well, I just want to examine that for a moment. Is a notation of consistent with special concern regarding digoxin intoxication the extreme score on the part of the cardiologist or is it rather unexpected and inconsistent with clinical status?

10

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A. They are both extreme scores but --

12

13

Q. Okay, but in different categories of his assessment?

14

15

16

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A. Yes, that is correct.

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Q. Okay. And even recognizing the range of the respective compelling natures of the criteria of Category A, is it fair to say there is a considerable step down to Category B?

22

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A. Yes.

Q. All right. And Category B requires the satisfaction of two criteria, does it not?

A. That is correct.

Q. First the time of reference, onset of critical events, call for emergency







BB4

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(ANSWERS BY DR. BUEHLER)

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assistance occurred between midnight and six o'clock

4

in the morning, and the cardiologist, consulting

5

cardiologist scored the death consistent with

6

possible digoxin intoxication.

7

A. Yes.

8

Q. Now does the use of the

9

time span midnight to six o'clock as one of the  
criteria in Category B suggest that you had come

10

to the conclusion that the time cluster that occurred

11

in so many of these deaths between midnight and

12

six o'clock was itself a suspicious circumstance?

13

A. Yes, and I may add to that

14

that long before we -- let me not add to that.

15

Q. Do I take it from that that

16

you had performed some sort of investigation as to  
the time, the reference time in deaths in the non-

17

epidemic periods? What is so unusual about the

18

children dying between midnight and six o'clock in

19

the morning in other words? There has got to be

20

some base line of comparison I take it?

21

A. That is correct. These

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criteria were developed as the investigation was in  
progress.

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Q. Yes.

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BB5

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(ANSWERS BY DR. BUEHLER)

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A. And really these criteria were put together as some sort of guideline for evaluating potential relationships between deaths and Hospital personnel.

In addition they were used in a more general sense to rank deaths based on our findings, the combination of findings from the consultants as well as a finding that we became aware of very quickly that there was an unusual clustering of deaths in the early morning hours.

Q. And finally, of course, you had Category C and a death fell into that if he had none of the characteristics that would qualify it for inclusion in either of the other categories?

A. Correct.

Q. Just going back to your definition of "ward associated" and it is used again on page 14, I would take it the one child in the group with which we have interest here that would fall into that category is the Pacsai child who was transferred from the ward to the intensive care unit and died there.

He would be a ward associated death in your terms, would he not?





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(ANSWERS BY DR. BUEHLER)

A. I can't recall specifically whether or not Pacsai was one of the children who died in the ICU, but if that is the case that would be a ward associated death.

Q. Okay. When we look at the report as it relates to ward associated deaths after the overall results - on page 14, halfway down the page - there were in all 56 ward associated deaths 20 of which occurred in the non-epidemic periods either before or after the epidemic period.

A. Yes.

Q. You say of the 36 epidemic-period deaths there were 18 Category A deaths, 10 Category B deaths and 8 Category C deaths.

THE COMMISSIONER: There is obviously a discrepancy - you might deal with this - in the numbers, is there not, because Woodcock is not included in the 36. Isn't that right?

MR. LAMEK: That is right.

Q. Although what -- was Woodcock included in your children?

A. Woodcock died --

Q. June 30th.

A. Correct, which by definition







Smith, Buehler  
Wallace, Kusiak  
dr.ex. (Lamek)

BB7

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( ANSWERS BY DR. BUEHLER)

placed him - placed her, rather, in the pre-epidemic period.

Q. Yes.

THE COMMISSIONER: Who is the one extra then that we have?

MR. LAMEK: Yes, you see we have 36 including Woodcock. You perhaps include Gittens who went from the ward to the ICU and died in the ICU.

A. I'm afraid I have to look into this more carefully.

A. (Dr. Wallace) Yes, we do have Gittens.

Q. Yes, I thought so.

A. (Dr. Smith) Gittens is in the Category C.

Q. Yes. Gittens was not included in our group because of the interval of time between the transfer and the death.

Now in the second paragraph under the heading "Ward-associated Deaths" on page 14, you refer to the reference time, time of onset of terminal events, time of death, and you report that for 26 of 36 epidemic-period deaths, the reference





BB8

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(ANSWERS BY DR. BUEHLER)

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time was between midnight and 6:00 a.m. compared

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to 2 out of 20 for non-epidemic deaths.

5

Are you able to tell me how many  
of those 26 who died in that period between midnight  
and 6:00 a.m. were in Category A and how many were  
in Category B?

8

A. I can't tell you that right

9

away.

10

Q. Okay.

11

A. The data is there in the

12

report to do that.

13

Q. Well, I have the information

14

but I hoped that you might have it rather more  
conveniently collated than I have it.

15

A. Actually I don't think we

16

have the specific listing of time of onset by

17

individual cases. In the report itself I mean.

18

A. (Dr. Smith) Not in the report.

19

Q. No, I don't think it is in

20

the report.

21

A. No, in the report itself

we don't have that listed.

22

Q. On page 15 referring to

23

patient characteristics you say:

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Smith, Buehler  
Wallace, Kusiak  
dr.ex. (Lamek)

BB9

(ANSWERS BY DR. BUEHLER)

"The median age of death was 1969 days (range of 18 to 6891 days) for the 11 pre-epidemic deaths, 42.5 days for the 36 epidemic-period deaths and 107 days for the 9 post-epidemic deaths."

A. Yes.

Q. And the most striking feature of that to the untrained eye, of course, is the very much lower median age for children who died in the epidemic period, ward-associated deaths in the epidemic period.

A. Yes.

Q. On the evidence that we have heard one might expect a larger number of deaths on a cardiology ward with very young children. Was the age differential in terms of median age a matter which you regarded as significant in looking at these results?

A. The way we present this data in the report does not lend itself to testing for significance.

Had we presented it as a mean age it would be possible to - mean as opposed to median -







BB10

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(ANSWERS BY DR. BUEHLER)

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it would be possible to use a statistical test to  
4 define them.

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I think simply by inspection,  
6 though, there are two points that should be made.  
There is a tremendous overlap of the ranges of  
7 ages, but clearly during the epidemic period there  
8 was a disproportionate number of younger children.

9

Q. Yes.

10

11

A. But the way we present it  
does not lend itself immediately to a statistical  
12 test.

12

13

We could have, for example, said  
14 that the per cent younger than one year versus the  
per cent older or there would be other ways of  
15 presenting data that would lend itself to that kind  
16 of test.

17

18

Q. The following paragraph too  
I would like some help with it if I might.

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Resuscitation status. You reported  
5 of 36 epidemic-period deaths versus 10 of 20 non-  
epidemic deaths occurred in patients who were  
classified as "do not resuscitate".

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If 50 per cent of the non-epidemic  
deaths were in patients for whom the order "do not





BB11

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(ANSWERS BY DR. BUEHLER)

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resuscitate" had been written, can one infer that even if the non-epidemic populations are generally older than the epidemic population, and even if they are less sick as you had concluded from your earlier study, a higher percentage of those deaths were apparently regarded as inevitable as evidenced by the "do not resuscitate" notation.

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Is that a fair inference to draw from the relative incidences of "do not resuscitate" orders?

12

A. There are two comparisons that I think you are making simultaneously.

13

14

Q. Okay.

15

A. I am not entirely sure I understand.

16

17

Q. I am not sure that I do either.

18

19

Do you want me to try to do it again?

20

A. Yes, please.

21

22

Q. You have 50 per cent of your non-epidemic deaths in children for whom a "do not resuscitate" order has been written.

23

24

A. Correct.

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BB12

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(ANSWERS BY DR. BUEHLER)

Q. And may one reasonably infer in the first place that the presence of a "do not resuscitate" order on the chart indicates that the death of the child is regarded as inevitable and the course is irreversible?

A. Yes, I think that is a reasonable assumption.

Q. An extremely sick patient?

A. Yes.

Q. A terminally sick patient?

There is a lower percentage of such orders written in the epidemic period with respect to children who died?

A. That is correct.

Q. Therefore even if the non-epidemic period children or population are older and less sick than those in the epidemic period, there appears to be a higher percentage of inevitable death situation among those who died?

A. Yes, that is correct.

Q. Is that fair?

A. Yes.

Q. It is a rather tortuous way of getting at it but do you understand the point I am







BB13

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(ANSWERS BY DR. BUEHLER)

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making?

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A. Yes.

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Q. Which would suggest, would it

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not, among those who died at least, a higher pro-  
portion of extremely terminally sick children in

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the non-epidemic period?

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DM/ak

(ANSWERS BY DR. BUEHLER)

A. Among those who died?

Q. Yes.

A. Yes, that is right.

Q. And indeed of the five do not resuscitate patients who died during the epidemic period Floryn was 19 years old; Heyworth was 11 years old; Murphy was 16 years old, and indeed there were only two of those five, Leith and Perreault who were two months and three weeks respectively, only two patients in the epidemic period who were infants in respect of whom do not resuscitate orders were written. Does that comply with your understanding of those facts?

A. Yes.

Q. Does it seem therefore that the younger population, if there was a younger population in the epidemic period did not seem to be producing, among those who died, a higher number of inevitable deaths, they had a relatively small number of inevitable deaths among those who died, did they not, as evidenced by the DNR orders?

A. May I check something in my notes?

Q. Yes, of course.





C2  
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3 (ANSWERS BY DR. BUEHLER)

4 A. I can break that information -  
5 broken down, this information is not in the report  
6 but it is information that we have.

7 Q. Just before you do that,  
8 Doctor, I should be clearer of course. The presence  
9 of a DNR order on a chart I guess is a function of  
10 two things; one, an assessment of the absolute  
11 inevitability of the child's death, but also the  
12 parents' consent to that order is it not, you are  
13 not likely to find a DNR order unless you have been  
14 in consultation and agreement with the parents,  
15 is that fair?

16 A. Dr. Smith, I don't think we --

17 Q. That is the evidence that we  
18 have heard with respect to the Hospital in any  
19 event. So it is not standing alone an indication  
20 that these were the only inevitably doomed children?  
21 I'm sorry, could we have your information please?

22 THE COMMISSIONER: I'm not sure  
23 that information of yours, that statement of yours  
24 is correct, standing alone it is --

25 MR. LAMEK: It is, that's right.

THE COMMISSIONER: It is but there  
may be others.





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3 MR. LAMEK: There may be others  
4 who inevitably were going to die irreversibly but  
5 for whom the parents did not consent, that is  
6 absolutely right, sir.

7 DR. BUEHLER: If you look at  
8 children who are under a year of age, or greater  
9 than five years of age, or you can break it down by  
10 under or over a year of age, most of the older  
11 children are the ones who are more likely, regardless  
12 of epidemic versus non-epidemic, to be classified  
13 do not resuscitate.

14 MR. LAMEK: Q. That in fact is  
15 what is borne out from that very small sample of  
16 five in the epidemic period, three were over the  
17 age of 11 or more years old, and only two were  
18 small children.

19 (ANSWERS BY DR. BUEHLER)

20 A. Yes.

21 Q. You also considered, the  
22 middle of page 15:

23 "Digoxin therapy and other medications."

24 Can you tell me please why you were  
25 interested in determining the time of dose of digoxin  
prior to death if the child were on digoxin?

A. One of the questions







(ANSWERS BY DR. BUEHLER)

that we specifically asked Dr. Kauffman to give us advice on was if the child died as a result of an overdose of digoxin what is, number one, the longest time between the administration of the intravenous dose and death that you might expect.

Q. Yes.

A. And his advice to us was that it could occur up to four hours later, much more likely to have occurred sooner but it conceivably could.

Q. You were asking at the outside?

A. The outside, yes. Similarly we asked if an overdose were administered by the oral route what is the outside time at which it could result in death. We looked at medications, a number of medications given during these various intervals, four hours, eight hours, to see whether or not children who died during the epidemic period were more likely to have been given medications and therefore were they more likely to be subject to an accidental medication error.

Similarly, we wondered if they were more likely to be given digoxin specifically, and therefore more likely to be subject to accidental





Smith, Buehler,  
Wallace, Kusiak,  
dr.ex. (Lamek)

(ANSWERS BY DR. BUEHLER)

digoxin error.

Q. And on the results that you produced, was it your conclusion that in terms of the time of lost administration of digoxin, and indeed any other drug, in children who died in the epidemic period as opposed to those who died at other times, there did not appear to be any greater occasion for medication error shortly before death in the epidemic period than at any other time?

A. That is correct. There was a converse finding if you may in that children who died during the epidemic period were actually less likely to have been given a dose of digoxin that was prescribed and documented in the Hospital chart within four hours prior to their death when compared to the non-epidemic period.

Q. You canvassed too, pre-mortem digoxin levels; other measures such as IV lines; nasal gastric tube feeding and that sort of thing. You report under "Other Therapeutic Measures":

"Within the epidemic - period group all 18 Category A deaths, 9 of 10 Category B deaths, and 4 of 8 Category C patients had an intravenous line."





(ANSWERS BY DR. BUEHLER)

I don't see at a quick look the information as to the non-epidemic, oh yes, 45 per cent of the non-epidemic deaths had an IV line at the reference time. You had a total of 18, 27, 31 of 36 of the epidemic period children had an IV line in place.

THE COMMISSIONER: Have we the data as to --

MR. LAMEK: I am sorry.

THE COMMISSIONER: Which of these children was the 31 that you had the IV line.

MR. LAMEK: We know they were all of the Category A18.

THE COMMISSIONER: Yes.

MR. LAMEK: Q. Can you tell me which of the Category B deaths did not have an IV line in place?

A. (Dr. Wallace) I believe Lutes.

Q. Lutes, thank you. And in the Category C patients?

A. I can't really tell.

Q. You can't tell?

A. Right.

Q. At the very bottom of page 15







(ANSWERS BY DR. BUEHLER)

over onto page 16 we come to the "Cardiologists Scoring". Can you help me, is it more useful to look at the text or at the tables on this?

A. I think it might be more useful to look at the tables.

Q. Table 7 is the long table that continues over 2 pages. It is a close run thing but I think I am marginally better at words than I am at numbers, so I will look at the text and flip to the table if I may.

The finding is stated at the top of page 16:

"For all categories, there were no significant differences in the distribution of scores between the pre and post-epidemic period."

Is that all categories, all subdivisions of cardiology deaths?

A. Yes.

Q. And indeed if I understand the numbers correctly, and perhaps you can demonstrate it more clearly from the table, a lower percentage of the epidemic deaths than of the non-epidemic deaths was scored as critical on admission, and as





Smith, Buehler,  
Wallace, Kusiak,  
dr.ex. (Lamek)

(ANSWERS BY MR. BUEHLER)

having a poor prognosis on admission, do I have that correctly?

A. Yes, that is correct, but I think it is important to note that --

Q. We are now looking at Table 7?

A. Yes, I am looking at Table 7. For the status on admission of the sub-total of 29 epidemic deaths, 12 were in critical condition, 60 per cent compared to 9 of the 36, 25 per cent; so approximately two times as many non-epidemic patients were in critical condition at the time of admission compared to epidemic patients, 60 per cent versus 25 per cent.

Q. And these are of those patients who died?

A. That is correct.

Q. In the non-epidemic and then in the epidemic periods?

A. Correct.

Q. And is that difference of statistical significance?

A. Yes, it is.

Q. Insofar as prognosis on admission is concerned, the difference in terms of





(ANSWERS BY DR. BUEHLER)

percentage of those having poor prognosis on admission is not so dramatic, but is nevertheless larger in the case of the non-epidemic period deaths than in the case of the epidemic period deaths.

A. It is 65 per cent versus 50 per cent, which is not a significant difference, it is a larger value but not statistically significant.

Q. But not statistically significant?

A. Yes.

Q. Does it follow from that at least that even if your conclusions stated this morning were correct, that the population on the cardiology wards in the epidemic period was generally younger and more severely ill than at other times, it does not appear that the children who died in the epidemic period were either more severely ill at admission, or had a poorer prognosis on admission?

A. That is correct.

Q. And indeed they were less severely ill and had generally better prognosis than those who died in the non-epidemic periods?

A. I would place more emphasis







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(ANSWERS BY DR. BUEHLER)

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on the severity rather than the prognosis.

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Q. Because of the statistical  
significance of that difference as opposed to the  
prognosis figures?

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A. The difference between 25  
per cent and 60 per cent I think is a more important  
difference than the difference between 50 per cent  
and 65 per cent.

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Q. It is equally true as I  
understand your report that a higher percentage  
of the epidemic deaths than of the non-epidemic  
deaths was scored as unexpected and inconsistent  
with clinical status, scored as consistent with  
special concern with respect to digoxin intoxication,  
and indeed was scored as requiring a high level of  
care in the reference time?

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A. Let me review those one at a  
time.

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Q. Okay, one at a time.

A. Concerning the time of death --

Q. We are now looking at the  
second page of Table 7.

A. The second page at the top.

Q. Right.







Smith, Buehler,  
Wallace, Kusiak,  
dr.ex. (Lamek)

(ANSWERS BY MR. BUEHLER)

A. There was one patient, there was one non-epidemic patient who had unexpected and inconsistent timing of death according to Dr. Nadas' clinical impression.

Q. Yes.

A. In other words, 5 per cent, one at 20, compared to 6 of 36 who died during the epidemic period, or 16 per cent, so roughly three times as many patients had that score. That difference however, breaking the table in that way was not statistically significant.

Q. Notwithstanding a factor of three at work?

A. Yes, the numbers are very small.

Q. Looking at the next table related to possible - mode of death related to possible digoxin intoxication, again emphasizing these are Dr. Nadas' clinical impressions; one of 20 or 5 per cent of non-epidemic patients have that score consistent with special concern, that extreme score compared to 11 of 36, or approximately 30 per cent of epidemic patients, so roughly six times as many patients during the epidemic period.





Smith, Buehler,  
Wallace, Kusiak,  
dr.ex. (Lamek)

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THE COMMISSIONER: Was this one  
Woodcock?

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DR. BUEHLER: Yes, in both cases  
that one patient was Woodcock.

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MR. LAMEK: Q. Is that a statis-  
tically significant difference?

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A. Yes, that is.

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Q. Now in light of what you said  
this morning about the higher level of care desired  
and that assessment being placed upon clinicians  
in Dr. Nadas' own hospital, the next comparison  
may or may not be of some significance, but I think we  
referred to it this morning, did we not?

(ANSWERS BY DR. BUEHLER)

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A. Yes.

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(ANSWERS BY DR. BUEHLER)

Q. That although 12 of 36 of the non-epidemic cases of Dr. Nadas' cases where a higher level of care was desired, similarly, 30 per cent of the non-epidemic deaths were similarly scored by Dr. Nadas?

A. That is correct.

Q. Okay. Just one question if I may. Could we turn perhaps to Woodcock in the Nadas reports. It is the very last report in the binder, page 109.

You identify Woodcock as being the one non-epidemic death which Dr. Nadas scored as being consistent with special concern with respect to digoxin intoxication.

Now, I agree in some of these forms Dr. Nadas has written in that extra third category under heading C. This is a case where he does not seem to - he has got a plus sign.

A. That's what that means.

Q. That's what that means?

A. Yes.

Q. Okay, it is consistent plus means with special concern?

A. Correct.







DD2

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(ANSWERS BY DR. BUEHLER)

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THE COMMISSIONER: Is there any relation between his answer to B and his answer to C? I know he is not here but the fact that he puts it unexpected, inconsistent with clinical status, does that help to bring about the special concern about digoxin? How did he work that out? How did he work out the special concern? Was that independent of whether it was unexpected and inconsistent with the clinical status?

DR. BUEHLER: Yes. They are two separate questions.

THE COMMISSIONER: I know they are. But I am just wondering if his answer to the first question influenced him on his answer to the second. Did anybody ever discuss that with him?

DR. BUEHLER: Let me try to give an example.

THE COMMISSIONER: We can solve the problem I suppose by looking to see if there are any --

DR. BUEHLER: Yes.

THE COMMISSIONER: If we look at, I don't know, there is always -- Oh, here's one which is O2007, page 98, and that would be Turner.





DD3

(ANSWERS BY DR. BUEHLER)

It seems to be unexpected but consistent with the clinical status and yet got a consistent plus on digoxin. Page 98.

DR. BUEHLER: Correct. If you look at the table in the Appendix there are some children that had the extreme score for timing and some that had the extreme score for consistency with digoxin intoxication and some had both.

THE COMMISSIONER: What table was that, Doctor?

DR. SMITH: Appendix 2.

DR. BUEHLER: Appendix 2.

DR. SMITH: I'm sorry, Appendix 3.

THE COMMISSIONER: Appendix 2 is the...

DR. WALLACE: Appendix 3.

DR. BUEHLER: Appendix 3.

THE COMMISSIONER: Appendix 3.

DR. BUEHLER: Approximately page 74 through 76.

THE COMMISSIONER: There are certainly some cases. I see. All right. Thank you.

MR. LAMEK: Q. Now, is there anything else that we should be looking at particularly





DD4

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(ANSWERS BY DR. BUEHLER)

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in Table 7 that we regard as significant in going

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to the conclusions of your report?

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A. I think one point that should be emphasized is the potential for misunderstanding these scores.

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Q. Yes.

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A. And when we look at, for example, the mode of death which is the middle table on the second page of page 7, if you look at the subtotal for non-epidemic deaths there were 10 children who died during the non-epidemic periods who had a mode of death that to Dr. Nadas appeared to be consistent with digoxin intoxication. That tells us that even during the period when there appears to be relatively little or no concern about deaths being due to possible digoxin overdose, half of the patients had a mode of death that was clinically consistent with digoxin overdose. That tells us that at least using the scoring that Dr. Nadas did the clinical pattern of death, particularly as it relates to possible digoxin overdose, is not specific. I think that is an important point.

Q. Understood. But, Doctor, is that a fair way of putting it because you have







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DD5 2 (ANSWERS BY DR. BUEHLER)  
3 focused on the middle column which is consistent  
4 with those in the right-hand column too which are also  
5 consistent but with special concerns?  
6 A. That's right.  
7 Q. And is it not fairer to say  
8 that Dr. Nadas regarded 11 deaths as consistent  
9 with digoxin overdose; one of them having special  
10 concern attached to it but considered 30 in the  
11 epidemic period to be consistent with digoxin  
12 intoxication, 11 of those having special concerns  
13 attached to them?  
14 A. That is quite correct.  
15 Q. And therefore, although I  
16 accept your point entirely of course that the mode  
17 of dying with digoxin intoxication is not specific,  
18 the fact is that Dr. Nadas discovered 11 such deaths  
19 in the non-epidemic period which he considered to  
20 have in a mode consistent with digoxin intoxication  
21 but 30 such deaths in the epidemic period. Is that  
22 fair?  
23 A. 11 of the 20 versus 30 of  
24 36?  
25 Q. Yes.  
A. Yes, that is an important







DD6

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(ANSWERS BY DR. BUEHLER)

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difference that distinguishes deaths during the epidemic period, you are quite correct.

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Q. You see, we have heard from highly respected people whose opinions are obviously respected that there is no particular set of symptoms which characterize death from digoxin overdose or specific to death from digoxin overdose. Indeed, we have heard cardiologists say, look, virtually all of these 36 deaths are so consistent. If I take anything from this may I take this that even though that be so half of the deaths that Dr. Nadas looked at in the non-epidemic period he considered to be - almost half - inconsistent with the mode of death that he would expect in the case of digoxin intoxication but only 15 per cent, 6 out of 36 in the epidemic period did he regard in that light. Is that fair?

18

A. 16.7, correct.

19

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Q. All right. I was never good at translating fixed into percentages.

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You then report upon the pathologist's consultation, page 16, and the pharmacologist's consultation and indeed we have heard from Dr. Kauffman himself with respect to his own results.





DD7

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(ANSWERS BY DR. BUEHLER)

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On page 17 you dealt with operating room associated deaths. I am not quite sure why you did that study but perhaps you can help us. What was the purpose in that study?

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A. The purpose of this part of the study was to determine whether or not differences between deaths that were ward associated during the epidemic period were also -- let me rephrase that. The purpose was to determine whether there were also differences during the epidemic period and the characteristics of OR-associated deaths.

13

14

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Q. Yes.

A. And whether or not the pattern of the OR-associated deaths resembled those of ward-associated deaths.

16

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Q. And you considered a variety of factors: The place from which the child went to surgery, features of the patients, procedures, prognosis, scores, and your conclusion was what?

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A. Well, this part of the study was not as important I think as other parts of the study. One of the interesting things we did observe however dealt with the location prior to surgery, whereas, for epidemic-period deaths there was a





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(ANSWERS BY DR. BUEHLER)

preponderance of deaths in children who were on  
Ward 4A. During the epidemic period, 10 of - reading  
from the middle sentence of that paragraph:

"For epidemic-period deaths 10 of  
28 or 35.7% were on Ward 4A and  
16 or 57.1% on Ward 4B."

So that for children who were  
admitted to the Hospital who passed through a  
cardiology ward and later died either in the operating  
room or in the ICU --

Q. In the ICU after the OR?

A. Yes.

Q. Yes.

A. There was not an apparent  
disproportion of those children from Ward 4A as  
we saw with ward-associated deaths. I think the  
second characteristic that distinguishes the  
pattern of deaths in OR-associated deaths deals  
with patient features and, that is, that the  
median age of death for pre-epidemic patients was  
146 days, for epidemic period patients 696 days  
and for post-epidemic period it was 569 days. In  
other words the children who went on to die either  
in the OR, after the OR during the epidemic period







DD9

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(ANSWERS BY DR. BUEHLER)

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were older, which is again different from the

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pattern we observed for ward-associated deaths.

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Q. You come on page 18 to

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another area of investigation, that of Possible

7

Digoxin-related Morbid Events.

8

A. Yes.

9

Q. I take it you are now looking

10

for episodes during the life of children where they

11

appeared to be suffering from a measure of digoxin

intoxication short of death?

12

A. Correct.

13

Q. Is that what we are looking

for here?

14

(ANSWERS BY DR. WALLACE)

15

A. Yes, that is correct.

16

Q. And what was the purpose

17

in looking for those incidents?

18

A. This part of the study was

19

done very early on in our investigation. It is

20

being reported here slightly out of sequence.

21

Because digoxin was a feature in some of these

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deaths, early on we reviewed the digoxin log books

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because all children who are on digoxin are monitored.

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We looked at the log books starting at the time of

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(ANSWERS BY DR. WALLACE)

the epidemic period to see in fact if any of these children had been having high levels of digoxin throughout their stay at the Hospital. We in fact found this not to be the case.

Q. Why were you interested in knowing that though?

A. We had asked ourselves if these children might have been exposed to continuing higher doses of digoxin than were prescribed for them.

Q. And there didn't appear to be any change in the appearance of elevated digoxin levels produced by the therapeutic monitoring program?

A. That is correct. The levels sent from Wards 4A and Ward 4B did not differ from the specimens sent from the ICU or the NICU, which are the other two wards which would mainly use digoxin.

Q. We come then to what you call the Death-Roommate Study, the purpose for which the first form in the binder, the first numbered form in the binder was prepared.

THE COMMISSIONER: I have the





DD11

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(ANSWERS BY DR. WALLACE)

advantage of seeing the clock. It is two minutes  
to our usual hour. Do you want to take a break  
now?

MR. LAMEK: It is an excellent time  
to take a break, thank you, sir.

THE COMMISSIONER: Yes, all right,  
fifteen minutes.

--- recess.





EMT.jc  
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--- On resuming:

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THE COMMISSIONER: Yes, Mr. Lamek?

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MR. LAMEK: Thank you, sir.

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Q. We have arrived I think at page

6

18 of the report, the heading VII, "Death Roommate Study".

7

Again I would ask you to help me,

8

please, if you would. What was the purpose in

9

conducting the death roommate study?

10

(ANSWERS BY DR. SMITH)

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A. The purpose in this study was

12

to try to determine what differences existed between

13

the children in a particular room that made them

14

die as compared to the surviving roommates.

15

We wanted to find out if any

16

particular process, any selection occurred to make

one child a death as compared to the other.

17

Q. Okay. Was this study done

18

reasonably late in the investigation? Where did it

19

fit into the overall work?

20

A. This study was started about

21

half way through our - the fall - half way through

the investigation.

22

Q. Had you by this time received

23

Dr. Nadas' scoring of the patients?

24

25







EE.2

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(ANSWERS BY DR. SMITH)

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A. I can't recall. Had we? We had.

4

I am told that we had.

5

Q. All right. That is Dr. Buehler's

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recollection in any event.

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THE COMMISSIONER: Also Dr. Wallace.

8

I saw all their nods.

9

MR. LAMEK: You got a casting vote,

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Dr. Wallace.

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Q. When you say "selection" are

12

you suggesting conscious selection of one patient  
rather than another? Was that what was in your mind?

13

A. That was a question we had, yes.

14

We didn't write that into the report.

15

Q. No.

16

A. But it was certainly a question

17

we had.

18

Q. Is it fair to infer from that,

19

Dr. Smith, by the time you embarked upon the death

20

roommate study you were at least entertaining the  
possibility that the epidemic was wholly or in part  
attributable to the acts of some person?

21

A. Yes. I would say that by this

22

time that was a consideration.

23

Q. I take it because having

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canvassed a number of other features that might have

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EE.3

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(ANSWERS BY DR. SMITH)

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provided an explanation you had drawn a blank on  
each of the investigations you had undertaken?

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A. That is right.

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DR. BUEHLER: May I add a subscript  
to that?

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MR. LAMEK: Certainly.

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DR. BUEHLER: Certainly by that time  
we had finished many of the different analyses that  
we had undertaken.

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I think by the very nature of the  
history of the event itself that was a concern.  
Certainly something that anyone approaching this  
issue would consider among possible explanations  
for this.

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MR. LAMEK: Q. All right. And  
considering that possibility you embarked upon a  
study to see if there was some, as I think you said,  
Dr. Smith, pattern of selection of one child as  
opposed to those in the same room as that child at  
the time he died?

20

21

A. That is correct.

22

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Q. In order to arrive at that  
comparison or study you appear to have identified  
a whole host of characteristics to see if they were





EE.4

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(ANSWERS BY DR. SMITH)

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in common or distinguishing features between the child  
who died and his surviving roommates.

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Are these many of the features and  
elements which were recorded in the general overall  
questionnaire that we have looked at?

7

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A. That is correct. Any feature  
that is mentioned here would have been included as a  
question in the questionnaire for both the cases and  
the controls.

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Q. All right. Age, race, sex,  
place of residence, diagnosis, condition, whether there  
had been a catheterization; if so, when; surgery,  
medications, presence or absence of I.V. lines. A  
whole host of factors that you mention in the long  
paragraph at the bottom of page 18?

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A. That is correct, yes.

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Q. And having considered all those  
variables did you conclude that there was any  
discernible pattern of selection as between the  
children who died and their surviving roommates?

A. I would like to refer to page 19.

Q. Yes.

A. "Nursing time required". These  
are the positive findings. Basically there were no







EE.5

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(ANSWERS BY DR. SMITH)

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differences in all of the categories listed in the  
second paragraph on page 19.

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However, the patients who died required  
more nursing care than their roommates. That is  
their NARvel score was higher overall.

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7

8

Q That is at the time of their  
death?

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A At the time of their death they  
required more nursing care, yes.

11

12

13

Q Does that suggest that at the  
time of their death they tended to be sicker than  
their surviving roommates?

14

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16

A Yes. At the reference time.

17

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Q Yes.

19

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21

A They were sicker than their  
roommates in general, yes.

22

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THE COMMISSIONER: As I trust before  
the reference time?

DR. SMITH: This is the closest  
NARvel score that they were given, closest to the  
reference time.

THE COMMISSIONER: Yes.

DR. SMITH: Because the NARvel scores  
occur only once a day.





EE.6

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(ANSWERS BY DR. SMITH)

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MR. LAMEK: Q Yes.

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A So this would have been the  
closest NARvel score for that patient.

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6

Q I am not sure that I understand  
paragraph numbered 2 under B on page 19. You say:

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"All of the following patient-care  
variables were associated with death:".

9

10

Does that mean that these various elements occurred  
in one or more deaths?

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A That they were - this means that  
the children who died were more likely to be younger,  
have had a cardiac catheterization, have been on  
oxygen therapy, have had an NPO feeding status,  
et cetera, than their roommate at the time, at the  
reference time.

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Q It is clearly my failure to  
comprehend what you are saying to me, but I see that  
two of those characteristics, for example, are NPO  
feeding status which you define as no oral, gastric  
or duodenal feeding. The next item is tube feeding.

21

Now to me those two tend to be  
contradictory.

22

23

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A (Dr. Buehler): If you look at the  
words that immediately follow the parentheses for





EE. 7

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(ANSWERS BY DR. BUEHLER)

3

tube feedings, "for those patients who were receiving feedings", so that even though in general the children who died were less likely to be receiving feedings --

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Q. If they were they were likely to be on tube feedings?

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8

A. They were more likely to be being fed by tube.

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(ANSWERS BY DR. SMITH)

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A. That is right.

Q. And then you issue a caveat with respect to the significance of those observations because you say:

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" ... because all of these variables may be associated with severity of illness and because severity could not be completely controlled in making comparisons".

A. That is correct.







EE.8

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(ANSWERS BY DR. SMITH)

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Q Are you suggesting that it may be those patients who exhibit those characteristics who are also those who on the NARvel scoring most closely proximate to the reference time were thought to be most in need of nursing care?

A That is correct.

Q They may not be two aspects of the same thing?

A Yes, but it is important to point out that the NARvel score is not strictly speaking an accurate --

Q No.

A -- assessment of severity.

Q It may be an indicator only?

A It may be an estimation --

Q Yes.

A An estimation of severity.

Q Were you able to draw any real or firm conclusions from this death roommate study? Was it of any significant assistance to you in solving this conundrum?

A Well, in the end it did not prove to be a very helpful study, but we had no way --

Q You didn't know that until you had done it?







EE.9

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(ANSWERS BY DR. SMITH)

A. Until we had embarked upon it.

Q. Fair enough. And so you come in Item No. 8 on page 19 to association of deaths with hospital personnel.

Can you tell me, please, why you embarked upon that exercise?

(ANSWERS BY DR. BUEHLER)

A. This was an issue that clearly had been raised before we arrived.

Q. Yes.

A. We felt that it was a compelling issue for us to address and I think we can give you an analogy of attempting to investigate a different type of outbreak in a hospital.

For example, an outbreak of infectious disease where in such an investigation it would, by routine, be considered an integral part of the investigation to determine whether or not a particular member of the physician staff or nursing staff or other ancillary staff might, for example, be a carrier of an infectious organism themselves.

Q. Yes.

A. Clearly we were concerned about the possibility of overdoses of digoxin, and we felt





EE.10

1  
2 (ANSWERS BY DR. BUEHLER)

3 that it was necessary to try and determine whether  
4 or not there was any association between individual  
5 members of the hospital staff and certain deaths .

6 Q And I take it that this was not  
7 an exercise which lay peculiarly within the province  
8 of epidemiologists. Having identified the deaths,  
9 particularly with the assistance of Dr. Nadas, having  
10 identified those to which some element of suspicion  
11 was thought to attach, I take it you did not need to  
12 be an epidemiologist to compare available information  
13 as to whereabouts of hospital personnel with those  
14 deaths?

15 A Well, I think we approached it  
16 from an epidemiologic point of view.

17 Q Yes.

18 A But you are correct. I think  
19 also the type of investigation we did clearly is  
20 different from the type of investigation that, for  
21 example, a police investigator might do.

22 Q Yes.

23 A I think as we go through this  
24 it will be important to keep that in mind.

25 Q As I understand it you attempted  
to establish where hospital personnel of all kind may





EE.11

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(ANSWERS BY DR. BUEHLER)

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have been at particular times. Ideally you would have  
loved to have had I take it a reliable timetable of  
everybody's movements for the nine-month period?

5

A. That would clearly be ideal.

6

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Q. Yes. And clearly the reality  
fell a good deal short of that?

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A. Correct.

9

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Q. You report on page 20 with  
respect to physician assignments:

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" ... they were determined from  
monthly rosters and nightly call  
schedules for residents, fellows and  
cardiology staff physicians. There  
was no permanent record of impromptu  
schedule changes made by physicians."

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Was that a matter that perhaps you  
could have remedied by inquiry? Could you not have  
started with the call schedules to determine who  
was supposed to be where at particular times with  
respect to doctors, and then had you noticed an  
association between one or more doctors and deaths  
made some inquiries as to whether in fact the people  
were actually where they were scheduled to be? Could  
you have done that?







EE.12

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(ANSWERS BY DR. BUEHLER)

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A. I think inquiries of that type were clearly beyond the scope of what we could have done.

(2)

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Q. All right. Did it really come to this, that the only group in the hospital about whom you had relatively complete and reliable information as to the whereabouts was the nursing group?

9

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A. That is correct.

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Q. Right. What other groups or persons did you attempt to establish such death about? We have referred to doctors. Were there any other groups or categories?

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A. May I deal with that first?

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Q. Yes, of course.

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A. We felt that - I think it is important to refer back to the early part of the text.

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Q. Yes.

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A. Where we in our meetings with hospital authorities, physicians, different persons who are familiar with the types of people who were on duty, we became aware that most of the ancillary personnel of the hospital such as physical therapists, respiratory therapists, occupational therapists, et cetera, and ward clerks go off duty at approximately





EE.13

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(ANSWERS BY DR. BUEHLER)

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10 or 12 o'clock - I'm sorry, between 10 and 11

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o'clock in the evening.

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Q. Yes.

6

A. In general, given the timing of

7

the problem that we were looking at, and given the

8

range of times in which overdoses of digoxin may have

9

been given as suggested to us by Dr. Kauffman, then

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the two groups - those hospital employees on whom

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we should focus the greatest attention should be the

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physicians and the nurses because they are there

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around the clock. There are others who visit the

14

wards after hours.

15

For example, there is the nightly

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collection of garbage around midnight or in the

17

vicinity of that time. There was a courier who

18

collected the NARvel scores and census information

19

at approximately midnight, but we focussed most

20

carefully on physicians and nurses.

21

We looked to a lesser extent at other

22

hospital employees, mainly during the latter three

23

months of the epidemic period when there was - when

24

some of these deaths occurred.

25

Q. Was it part of your thinking

in narrowing your focus to doctors and nurses that





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Wallace, Kusiak  
dr.ex. (Lamek)

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EE.14

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(ANSWERS BY DR. BUEHLER)

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they were the two groups who would be least likely

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to arouse comment if seen in a child's room? Was

5

that part of the narrowing process?

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(ANSWERS BY DR. BUEHLER)

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A. That was the concern in the realm of possibility that we had but -- yes, that is correct, sir.

6

7

Q. When you come to the results -- I'm sorry, before you get to the results, the second full paragraph on page 20 it says:

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"Nursing assignments were determined from personnel records maintained by the Head Nurses on Wards 4A/B and from the nursing assignment workbooks."

13

14

Were those personnel records or payroll sheets or something that go to make up payroll sheets?

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A. (Dr. Smith) They were the final correction that went to Payroll, so that someone might be entered as being there but if they didn't show up they would be crossed out, so they were the handwritten corrected sheets that were used by Payroll.

21

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Q. Sort of clocking on and clocking off information?

A. (Dr. Smith) Yes, that is correct.







1 (ANSERWS BY DR. BUEHLER)

FF2

2 Q. You say:

3 "This task was performed by a Ward  
4 4A team leader who was familiar  
5 with these documents. (She was  
6 recommended by the nursing administra-  
7 tion...)"

8 Not a member of the Trayner team.

9 "A nursing calendar was constructed  
10 to define individual nurse person-  
11 hours on the cardiology wards  
12 throughout the epidemic period."

13 Can you tell me a bit more about that  
14 nursing calendar, what was it? Was it a huge  
15 timetable of who was there and when?

16 A. Yes. We broke down the  
17 entire epidemic period into one half hour intervals  
18 and we attempted to identify over that entire nine-  
19 month period who was there and who was not on  
20 Ward 4A and 4B.

21 Q. Who actually constructed that  
22 nursing calendar?

23 A. The nursing calendar was  
24 constructed by - do you want the name of the  
25 person?

Q. Yes, please.





FF3

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(ANSWERS BY DR. BUEHLER)

A. Miss Cathy Shilton.

Q. Yes. And what check was made of the accuracy of her work?

THE COMMISSIONER: I'm sorry, was she on your staff?

MR. LAMEK: No she is a nurse at the Hospital.

THE COMMISSIONER: Cathy what?

DR. BUEHLER: Shilton.

DR. SMITH: Shilton.

THE COMMISSSTONER: Yes. Thank you.

(ANSWERS BY DR. SMITH)

A. We did several checks of her transfer of the information into single 24-hour sheets that she captured from the workbooks and from the payroll books. These data were then translated into a questionnaire that was suitable for entry into a computer, so that we could deal with the data, that we could handle the data in a computer; we further checked any inconsistencies in the data when we had the computer printout back with the original data and found some errors, we made further corrections, had several runs of that which our statistician can address, and any time that there was





Smith, Buehler  
Wallace, Kusiak  
dr.ex. (Lamek)

FF4

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(ANSWERS BY DR. SMITH)

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a discrepancy found we went back to original data  
4 and ensured that in fact appropriate entries had  
5 been made.

6

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MR. LAMEK: Q. When we come to the  
results set out at the bottom of page 20 you first  
say:

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"There was no association observed  
between any physician and deaths  
during the epidemic period and no  
association between deaths and  
housekeeping personnel or ward  
clerks."

14

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16

Is there some intended significance  
to the slight change in the wording as it relates  
to physicians and then as it relates to housekeeping  
personnel and ward clerks? You say:

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"There was no association observed  
between any physician and deaths..."  
and then:

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(ANSWERS BY DR. BUEHLER)

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A. No, there is no significance.







FF5

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(ANSWERS BY DR. BUEHLER)

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Q. Do the two mean you were not able to see any association because you didn't have the information?

A. Well, for physicians, in general the physicians rotated on and off the service at approximately four to six week intervals.

Q. Yes.

A. If you look at a nine-month period using the information that we had concerning when physicians were there based on the cost schedule we didn't see any pattern of association, consistent association, between individuals and deaths.

Q. And when you refer to physicians I take it you are including house staff like residents?

A. Residents, Fellows.

Q. And staff physicians?

A. Yes.

Q. You say:

"...there were 280 nurses who worked on Wards 4A/4B during the peidemic period."

That is the grand total of everybody





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(ANSWERS BY DR. BUEHLER)

who came onto that ward in a nursing capacity in that period I take it?

A. That is right.

Q. And of those 280, 46 of them were on duty at the reference time for one or more ward-associated deaths. 57 were on duty within four hours preceding the onset of terminal events for one or more deaths, and you refer to Table 10 and Table 9, and we will look at those in a moment.

"The relative risk for the onset of a terminal event occurring within four hours of a nurse's presence on the ward is shown in Table 11 for the 12 nurses associated with the greatest number of Category A deaths. There are no differences between these risk estimates and those for events occurring during or within eight hours of a nurse's presence on the ward; the latter data are therefore not shown. For the four cases where the consultant pharmacologist estimated an approximate time of digoxin administration,





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FF7 2 (ANSWERS BY DR. BUEHLER)

3 nurses on duty at those times are  
4 shown in Table 12."

5 Perhaps therefore we should look at  
6 Tables 9 to 12; I seek please your clarification  
7 or explanation of them as you think necessary.

8 A. Table 9 shows us the  
9 frequency of nurses on duty at the time of onset  
10 of terminal events for ward-associated deaths and  
11 during the epidemic period. There were 18 Category A  
12 deaths, 10 Category B deaths and 8 Category C  
13 deaths in a total of 36 deaths. The nurses are  
14 ranked in descending order, in general, and you  
15 can see that there was one nurse who was on duty  
16 at the time of terminal onset events for 18 of  
17 18 Category A deaths, for 10 of 10 Category B  
18 deaths and for 4 of 8 Category C deaths. And  
19 similarly you can read down the line.

20 There was a nurse who was on duty  
21 for 12 of 18 Category A deaths, 9 of 10 Category B  
22 deaths.

23 If we turn to Table 10, this is  
24 similar to Table 9 but it looks instead at frequency  
25 of nurses on duty within four hours prior to onset  
of terminal events. There we observe similar trends.







FF8

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(ANSWERS BY DR. BUEHLER)

There was one nurse who was on duty, Nurse 401, for 18 of 18 Category A deaths, 10 of 10 Category B deaths, 4 of 8 Category C deaths, and so on.

If we turn to Table 11, we are now looking at the rate of deaths during the time that a nurse was on duty compared to the rate of deaths during the time that the nurse was not on duty.

Q. Yes.

A. And we broke that down by shifts. The relative risk is simply the rate that occurred while the nurse was on duty divided by the rate of deaths while the nurse was not on duty.

For Nurse 401, the relative risk estimates - and this table is on the Category A deaths alone - was infinity. That simply reflects the fact that there were no deaths.

Q. No Category A deaths.

A. No Category A deaths that did not occur within four hours of her being on duty, and so on.

Do you want to go down the table in more detail than this or is it adequate just to explain what the table means?

Q. Perhaps you can just take the







FF9

(ANSWERS BY DR. BUEHLER)

next nurse, 402, because there we do have some numbers and we do have something to divide into.

A. Okay.

Q. Can you explain that line for us?

A. Nurse 402 was on duty 657 hours during the day shift during that nine-month period, and off-duty 2,643 hours. There were zero Category A deaths that occurred within four hours of her being on duty during the daytime and 2 that occurred while she was off-duty. Therefore, the rate while she was on duty was zero divided by 657, that value divided by 2, divided by 2,643 which is obviously zero.

On the night shift during that nine-month period she was on duty 635.5 hours and there were 12 deaths which occurred within four hours of her being on duty during the night shift. There were 4 deaths which occurred at times when she was not at the Hospital within four hours of the child's terminal onset, onset of terminal events. Therefore, the rate while she was on duty was 12 divided by 635.5, that value divided by 4 over 2,664.5 or 12.6.

Q. Can I just understand one





1  
2 (ANSWERS BY DR. BUEHLER)

3 thing, Dr. Buehler, please.

4 A. Yes.

5 Q. You are talking about the  
6 onset of terminal events occurring within four hours  
7 of a nurse's shift.

8 A. That is correct.

9 Q. Does that mean during a  
10 nurse's shift or within four hours after its end?

11 A. That is correct. It could  
12 have occurred either during -- yes.

13 Q. Okay.

14 A. But that is correct.

15 It is interesting to note however  
16 that you might ask the question, what if the death  
17 occurred five minutes after she got there?

18 Q. Yes.

19 A. And if you look at the  
20 pattern of these deaths that is not an issue. The  
21 nurses came on duty at 1930.

22 A. (Dr. Smith) That is right,  
23 1930.

24 A. And in most cases these  
25 deaths are occurring, are having onset of terminal  
events after midnight, which is at least four hours





FF11

(ANSWERS BY DR. BUEHLER)

after 1930. So that might be a concern that someone would point out to us that was not in issue. So we have relative risk of these events occurring broken down by day shift, night shift and total.

THE COMMISSIONER: As I understand the equation is 12 over 635.5?

DR. BUEHLER: Yes.

THE COMMISSIONER: Over, that is the whole equation, over 2664.5; is that the way it works out?

DR. BUEHLER: Correct.

THE COMMISSIONER: That will be 1 over 50, is that right, over 1 over 400. I am trying to check this in the mathematics. It is 1 over 50 or 1 over 400 which makes it roughly 1 over 12; is that right, 1 over 8, that would make it, is that right? I am just wondering how we get to 12.6? What does it mean, the relative risk?

DR. BUEHLER: The relative risk is an estimate of the strength of the association between the presence of an individual and death and you could say that for Nurse 401 the relative risk was infinity; in other words, they all occurred well within four hours of her being on duty. That is







1  
FF12 2 (ANSWERS BY DR. BUEHLER)

3 a very strong association, obviously. You don't  
4 need statistics to tell you that.

5 THE COMMISSIONER: No, no, but  
6 what is the 12.6? What does that mean? The relative  
7 risk is 12.6 of what?

8 DR. BUEHLER: Okay. Actually, if  
9 you are interested I can go through the arithmetic  
10 step by step.

11 THE COMMISSIONER: Well I can do  
12 the arithmetic but I don't know what to do with  
13 the results.

14 DR. BUEHLER: Okay. That means that  
15 the rate of death while she was on duty was 12.6  
16 times greater than the rate of deaths that occurred  
17 while she was not on duty.

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THE COMMISSIONER: Yes, deaths on  
duty. It was 12.6 times...

DR. BUEHLER: Greater than the rate of  
deaths while she was not on duty.

MS. SYMES: Excuse me, would you just  
do 402 nights, which numbers you plugged in to get to  
12.6 again, please, I apologize.

DR. BUEHLER: I would be happy to. Is  
there a blackboard available?

MR. LAMEK: There was but you are sitting  
in its place now.

MS. SYMES: There is one here.

DR. BUEHLER: You were interested in  
doing it for nurse 402 for the nighttime, is that  
correct?

MS. SYMES: Yes, please.

DR. BUEHLER: There were 12 deaths that  
occurred within 4 hours of her being on duty and she  
was on duty for 635.5 hours. There were four deaths  
which occurred while she was not on duty or not within  
four hours, which is 2664.5. You have a calculator  
handy?

MR. KUSIAK: I will do it. That 4 divided  
by 2664.5, that is .001501 and the ratio is 0015 -- well,  
I get 2 something. I must have made a mistake.





1  
2 THE COMMISSIONER: No, I can get it  
3 without any trouble at all without using any calculator  
4 at all. It is one over 50 over one over 600 which works  
5 out as one over 50 times 600 over one and you get 12.  
6 I have no trouble with it. That is because I never  
7 learned a calculator.

8 DR. BUEHLER: That's the reason you  
9 don't do arithmetic in front of an audience. Does that  
10 answer the question that you asked?

11 MS. SYMES: Yes, thank you.

12 MR. YOUNG: Just for your reference,  
13 Mr. Commissioner, I think the error made was Dr. Buehler  
14 divided two into 635.5 instead of 12 and that's the  
15 reason why it doesn't work.

16 DR. BUEHLER: Okay, shall we proceed?

17 MR. LAMEK: Q. I take it looking at  
18 the T line under nurse 402 we now know to have been  
19 Nurse Nelles. But looking at the total of the hours  
20 she spent on duty, the hours that she spent off duty  
21 in the epidemic period, the total number of deaths that  
22 occurred while she was on duty are within four hours  
23 of her being on duty, the total number of deaths that  
24 occurred more than four hours after she went off duty,  
25 your relative risk was 8.2, which as I understand you,  
means that the death rate while she was on duty was







(ANSWERS BY DR. BUEHLER:)

8.2 times greater than it was when she was not on duty in the totality for that nine month period. Do I understand that correctly?

A. That is correct.

Q. Okay. And so on down through the list of nurses.

A. In table 11 we have done similar calculations for category B deaths, but by definition the category B deaths all occurred on the night shift. So, we have a rate only for night shift hours. And then on the next page, table 11 continued. We have the relative risk estimates for all deaths. If we look at the individual nurses going down the list we see that, for example, for nurse 401 during the day shift that the death rate was 6.5 times greater during the days that she was on compared to the days that she was not on.

On the night shift the relative risk was one to 1.5 times greater of a death occurring during the night that she was on compared to the nights that she was not on.

If you look at the relative risk regardless of day or night shift overall the rate of deaths that occurred of all ward associated deaths during that







(ANSWERS BY DR. BUEHLER:)

period was 33.3 times greater during the hours that she was on duty compared to the hours that she was not on duty. And you can go down the list.

On the next page we looked at information that Dr. Kauffman provided us. There were four deaths where he was able to provide an approximate time of -- when digoxin may have been administered. For the first one, case 02040, there were several nurses who were on duty within that time period of 30 to 90 minutes before that child deteriorated. If you look at those four deaths there was only one nurse who was on duty at a time that all four of those children died.

Q. I'm sorry, is that died or once again the reference time?

A. No, I'm sorry. There was only one nurse who was on duty at that time that Dr. Kauffman estimated the digoxin overdose may have been administered.

Q. Thank you.

A. Okay. Of these four patients here, two of them are patients who were prescribed digoxin -- I'm sorry, who were never prescribed digoxin during their hospitalization, yet in whom





(ANSWERS BY DR. BUEHLER:)

digoxin was found in post mortem tissues. That is case 02040 and case 02064.

THE COMMISSIONER: Lombardo and Cook .

DR. BUEHLER: Yes, Lombardo and Cook .

There were two other patients who similarly had digoxin detected in post mortem tissues in whom digoxin had not been prescribed: Belanger, 02041 and Hines 02057.

Again, if you look at those four deaths separately, and this information is not presented in total in this table, if you look at the four deaths where digoxin was apparently inappropriately present in post mortem tissues, again, there was only one nurse who was on duty within four or within eight hours for that matter of the time that those four children died; that was nurse 401. I think it is important to also look at the actual times that we are dealing with here because it brings up the issue that you raised earlier about other personnel. That first case, Case 02040 is a child who suffered terminal deterioration at 3:30 in the morning, 90 minutes before that it is 2 in the morning.

The next case, 02061, is a child who suffered terminal deterioration at 2:30 in the morning





1  
2 (ANSWERS BY DR. BUEHLER:)

3 and therefore 120 minutes before that would be  
4 half past midnight.

5 The next case, Case 02065, is a  
6 child who suffered terminal deterioration at  
7 approximately 2:40 in the morning and 60 minutes  
8 before that is 1:40.

9 The next child, 02064, is a child  
10 who suffered terminal deterioration at approximately  
11 4:18 and 60 minutes before that is 3:18.

12 Of the others that had inappropriate  
13 digoxin, the other two, 02041, this is a child who  
14 suffered terminal deterioration at 1930 in the evening  
15 and if we were to, say, use an estimate of 4 hours,  
16 or 8 hours for that matter, it would not get close to  
17 midnight certainly.

18 Then, the last case that had inappropriate  
19 digoxin present in tissues was 02057, the child who  
20 had onset of terminal events at approximately 4:25;  
21 4 hours before that would be approximately 30 minutes  
22 after midnight.

23 Q. I'm sorry, you are going to have  
24 to take me by the hand through that connective link.  
25 You have pointed out all those times and referred to  
something we said earlier.







(ANSWERS BY DR. BUEHLER:)

A. I think in particular the concern is raised about looking at, for example, the people who picked up garbage at midnight or the person who picked up the NARvel scores at approximately midnight. It is difficult to see, given what Dr. Kauffman has told us about possible times of digoxin overdose, that that person could be associated with a death that occurred at 1930 in the afternoon-- in the evening, yes.

Q. Yes.

A. The other point is that our understanding is that most other ancillary personnel go off duty at approximately 10 or 11:00 at night.

Q. Yes.

A. And therefore at the outside 11:00 at night is several hours after these times. I think it is also important to mention that these times are clearly approximate estimates that Dr. Kauffman made.

Q. Yes. Doctor, in each of the tables that you discussed, 9, 10, 11, certainly those three, and to an extent table 4, do they not reflect as one would expect that the members of the same nursing team, whether it be the Trayner nursing team or any other, tend to be grouped together in your table of





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(ANSWERS BY DR. BUEHLER:)

frequency of presence?

A. That is correct.

Q. For example, once I have gone past 401, 402, 403, 404, whom we know to be respectively Trayner, Nelles, Scott and Christie, I then get into the members of the 4-B team who were usually on duty at the same time as that team.

A. That is correct.

Q. Okay.

A. And your comment brings to mind another important factor and, that is, in doing these assessments we considered any nurse on 4A or 4B to have potential access to a patient on either 4A or 4B.

Q. Okay. Well, do I understand, Doctor, this perhaps comes to two propositions, that in the first place there is one person and, that is to say, Nurse Trayner who, on the data available to you, appears to have been present for all category A and category B deaths.

A. That is correct.

Q. But your finding goes no further than that, does it, and there is no suggestion that constant presence of that one nurse therefore indicates





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access by that one nurse to those children?

A. That is a very important point  
and that is correct.

Q. Okay.

A. I would add to that that these  
are associations.

Q. Yes, they are merely indications  
of who was present.

A. That is correct.

MR. LAMEK: Mr. Commissioner, I am about  
to go to the wrap up matters, the mortality considera-  
tions in the summer of '82 and the conclusions and  
summary, can I complete it in the morning, please?

THE COMMISSIONER: All right, 10:00  
tomorrow morning, then.

MR. LAMEK: Thank you.

THE COMMISSIONER: I should say that  
I don't know what the proceedings are going to be, but  
I understand that Mr. Roland and Mr. Scott will not  
be available tomorrow.

MR. ROLAND: That is correct, Mr.  
Commissioner, if we could be put over to Wednesday I  
would appreciate it.

THE COMMISSIONER: Yes. Well, I don't  
think there will be that much trouble as long as there







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are counsel prepared to go on. Ms. Symes, are you

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prepared to go on tomorrow?

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MS. SYMES: I will make myself prepared.

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THE COMMISSIONER: Yes. Mr. Young,

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are you ready to go on tomorrow if need be?

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MR. YOUNG: I expect that I can be,

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Mr. Commissioner.

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THE COMMISSIONER: Yes, all right. Well,

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I think that will solve our problem.

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MS. SYMES: Excuse me, could you give

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an indication as to the order, Mr. Commissioner, will

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it be the normal order?

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THE COMMISSIONER: The order will be, as I understand it, Mr. Brown will be first. Is that correct?

MR. BROWN: If we cross-examine, Mr. Sopinka would like to do it. He is unavailable tomorrow and would ask to be stood down till Wednesday.

THE COMMISSIONER: All right. Well now, Mr. Hunt, can you start off?

MR. HUNT: Yes, sir.

THE COMMISSIONER: All right. And after that then it will be Miss Symes I think?

MS. SYMES: Normally you go this way but...

THE COMMISSIONER: I don't always. You can't trust me but if you want I will ask Mr. Young if he will go next. Or, no, I guess Mr. Ortved, you are next in line, are you?

MR. ORTVED: Yes.

THE COMMISSIONER: Are you happy to go?

MR. ORTVED: Absolutely.

THE COMMISSIONER: And Mr. Young?

MR. YOUNG: Yes.

THE COMMISSIONER: Miss Symes, will





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3 you fit in there?

MS. SYMES: Yes.

4 THE COMMISSIONER: All right. Then,  
5 Mr. Knazan, if you come on tomorrow are you ready  
6 to go?

7 MR. KNAZAN: Yes, I will be  
8 prepared, sir.

9 THE COMMISSIONER: All right. And,  
10 Mr. Olah, are you ready?

11 MR. OLAH: I guess I will have to  
12 be, sir.

13 THE COMMISSIONER: Well, I think  
14 I would like you to be ready, and that means I  
15 think that will keep us occupied, but I will proceed  
16 with... Then by that time Mr. Sopinka will be here  
for whatever the day is, Wednesday; is that right?

17 MR. BROWN: That is right.

18 THE COMMISSIONER: And thereafter  
19 as required as the subpoenas say?

20 MR. BROWN: Hopefully.

21 THE COMMISSIONER: All right. Well,  
22 that is the way we will do it.

23 ---Whereupon the hearing adjourned at 4:35 p.m. until  
24 Tuesday, January 24th, 1983 at 10:00 a.m.  
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